KARUPPANNAN MARIAPPAN COLLEGE

(AUTONOMOUS)

(Co-Educational Institution, Affiliated to Bharathiar University, Coimbatore and Recognized u/s 2(f) & 12(B) of UGC act 1956 and Accredited by NAAC with "B" Grade)

Chettiarpalayam, Kangayam Road, Muthur -638 105.

Tirupur District, Tamil Nadu.

DEPARTMENT OF MATHEMATICS

B.Sc., (MATHEMATICS)

SYLLABUS

CONTROLLER OF EXAMINATIONS
Muthur - 638105
Karuppannan Mariappan College (Autonomous)

கருப்பண்ணன் மாரியப்பன் கல்லூரி
முத்தூர் – 638 105.
ஒழுக்கம் கடமை வாய்மை

(Students admitted during the academic year 2024-2025 and onwards)

(Under CBCS with Outcome Based Education (OBE) Pattern)

DEPARTMENT OF MATHEMATICS

Vision

To strengthen the mental calculations, approximations, predictions, estimation of results and Mathematical problems to meet the challenge open to them.

Mission

- To achieve innovation in teaching, learning and research to realize goals of higher education.
- To improve the perspective of students on mathematics as per modern requirements.
- To empower the learners in achieving their professional goals related to mathematics through invited talks and workshops.

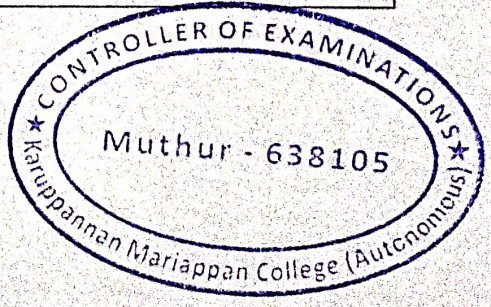
Eligibility for admission:

Should have studied Mathematics along with Physics & Chemistry in higher secondary education.

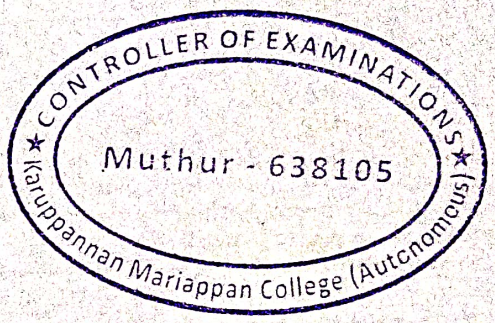
Regulation:

Regulation 2024-25 framed for the conduct of undergraduate programme is applicable.

Programme Outcomes (POs)	
On successful completion of the **B. Sc. Mathematics** programme	
PO1	Students are empowered with analytical and logical skills-to formulate results and construct mathematical argument.
PO2	Ability to organize, analyze and interpret data accurately in both academic and non -academic context.
PO3	Demonstrate effective communication of mathematical ideas and creative thinking skills to facilitate solving real world problems as a team and independently.
PO4	Appreciate and identify the connections between Mathematics and other disciplines.
PO5	Competency to obtain employment in education , public and private sectors..
PO6	Identify the area of interest for extended learning from the understanding gained from the domain and allied areas of Mathematics.
PO7	Develop mathematical aptitude and make critical observations.
PO8	Garner innovative ideas to face global challenges.
PO9	Instill a sense of responsibility in tackling professional and social issues ethically.
PO10	Trigger their passion for research in unexplored areas of Mathematics.



Programme Specific Outcomes (PSOs)	
After the successful completion of **B. Sc. Mathematics** programme, the students are expected to	
PSO1	Maintain a core of mathematical and technical knowledge that is adaptable to changing technologies and provides a solid foundation for extended learning.
PSO2	Identify the applications of Mathematics in other disciplines and society.
PSO3	Develop an in-depth knowledge in Mathematics appreciating the connections between theory and its applications .
PSO4	Demonstrate their mathematical modeling ability, problem solving skills, creative talent and power of communication necessary for various kinds of employment.
PSO5	Develop mathematical aptitude and the ability to think abstractly.



B.Sc., Mathematics Degree Course

(For the students admitted during the academic year 2024-2025 and onwards)

CIA- Continuous Internal Assessment Marks, ESE- End Semester Examination Marks

S. No.	Course Code	Part	Course	Duration Hours	Maximum Marks		Total Marks	Credits
					CIA	ESE		
			SEMESTER–I					
1	24U1LT1	I	Language–I	6	25	75	100	4
2	24U1LE1	II	English-I	6	25	75	100	4
3	24U1MAC1	III	Core-I : Classical Algebra	5	25	75	100	4
4	24U1MAC2	III	Core-II: Calculus	5	25	75	100	4
5	24U1MAA1	III	Allied-I : Mathematical Statistics - I	6	25	75	100	4
6	24U1VE1	IV	Foundation Subject - A: Environmental Studies	2	-	50	50	2
			Total	**30**	**125**	**425**	**550**	**22**
			SEMESTER–II					
1	24U2LT2	I	Language–II	6	25	75	100	4
2	24U2LE2	II	English-II	4	25	25	50	2
3	24U2MAC3	III	Core-III : Differential Equations & Laplace Transforms	5	25	75	100	4
4	24U2MAC4	III	Core-IV : Trigonometry, Vector Calculus and Fourier series	5	25	75	100	4
5	24U2MAA2	III	Allied-II: Mathematical Statistics - II	6	25	75	100	4
6	24U2VE2	IV	Foundation Subject - B: Human Rights	2	-	50	50	2
7	24U2NM1	IV	Naan Mudhalvan: Effective English: Language Proficiency for Employability	2	50	-	50	2
			Total	**30**	**175**	**375**	**550**	**22**
			SEMESTER–III					
1	24U3LT3	I	Language–III	6	25	75	100	4
2	24U3LE3	II	English-III	6	25	75	100	4
3	24U3MAC5	III	Core-V : Analytical Geometry	4	25	75	100	4
4	24U3MAC6	III	Core-VI: Mechanics	4	25	75	100	4
5	24U3CMA01	III	Allied-III: Accountancy - I	5	25	75	100	3
6	24U3MASPR1	IV	Skill based subject – I: LAB -1 : R Programming (Practical)	3	25	50	75	2
7	24U3MAN1	IV	Non Major Elective Course – I: Quantitative Aptitude-I	2	50	-	50	2
			Total	**30**	**200**	**425**	**625**	**23**

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SEMESTER–IV

1	24U4LT4	I	Language–IV	6	25	75	100	4
2	24U4LE4	II	English-IV	4	25	75	100	4
3	24U4MAC7	III	Core-VII : Linear Algebra	4	25	75	100	4
4	24U4MAC8	III	Core-VIII: Foundations of Analysis	4	25	75	100	4
5	24U4CMA02	III	Allied - IV : Accountancy-II	5	25	75	100	3
6	24U4MAPR2	IV	Skill based subject – II: LAB-2: C – Programming (Practical)	3	25	50	75	2
7	24U4NM1	IV	Naan Mudhalvan: Office Fundamentals : Digital Skills for Employability	2	50	-	50	2
8	24U4MAN2	IV	Non Major Elective Course – II: Quantitative Aptitude-II	2	50	-	50	2
			Total	**30**	**250**	**425**	**675**	**25**

SEMESTER–V

1	24U5MAC9	III	Core-IX : Modern Algebra-I	6	25	75	100	4
2	24U5MAC10	III	Core-X : Real Analysis - I	5	25	75	100	4
3	24U5MAC11	III	Core-XI : Complex Analysis	6	25	75	100	4
4	24U5MAE1/ 01/ 02	III	Elective-I :	3	20	55	75	2
5	24U5MAPR3	III	Elective-I : LAB -3	2	10	15	25	2
6	24U5MAE2/ 01/ 02	III	Elective-II:	5	25	75	100	4
7	24U5MAS1	IV	Skill based subject – III: Latex	3	25	25	50	2
			Total	**30**	**155**	**395**	**550**	**22**

SEMESTER–VI

1	24U6MAC12	III	Core-XII : Modern Algebra-II	6	25	75	100	4
2	24U6MAC13	III	Core-XIII : Real Analysis - II	6	25	75	100	4
3	24U6MAC14	III	Core-XIV : Number Theory	5	25	75	100	4
4	24U6MAE3/ 01/ 02	III	Elective - III	5	25	75	100	4
5	24U6MAPV1	III	Project & Viva Voce	3	25	75	100	4
6	24U6MAS2	IV	Skill based subject – IV: Sage Math	3	25	25	50	2
7	24U6NM3	IV	Naan Mudhalvan: Project Based learning -Data Analytics & Visualization	2	50	-	50	2
8	24U6MAEA1	V	Extension Activities	-	50	-	50	2
			Total	**30**	**250**	**400**	**650**	**26**
			Grand Total	**180**	**1155**	**2445**	**3600**	**140**

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List of Elective papers		
Elective - I	01	*Python Programming
	02	*Programming in C++
Elective - II	01	Operations Research
	02	Astronomy
Elective - III	01	Numerical methods
	02	Automata Theory & Formal Languages

***All computer papers have Theory and practical**

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SEMESTER-I

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	24U1MAC1	CORE -I	5	4	25	75	100
Course Title		CLASSICAL ALGEBRA					

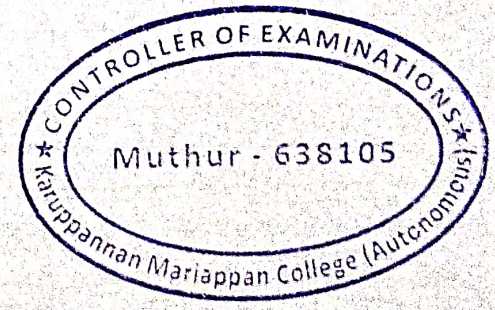
S.NO.	COURSE OBJECTIVES
1	To gain complete knowledge of Binomial , Exponential , Logarithmic series and their application to summation and of series
2	To study intensively the convergence and divergence of different types of series
3	To demonstrate the standard methods to solve both polynomial and transcendental type equations
4	To understand the concept of problem solving skills on Theory of equations
5	To gain knowledge about to solve multiple roots

COURSE OUTCOMES (COs):

On the successful completion of the course, students will be able to:

CO Number	Course Outcomes	Knowledge Level
CO1	Find the sum of finite and infinite series through Binomial, Exponential and Logarithmic series and their application to summation of series	K1,K2
CO2	Acquire a clear knowledge regarding methods to find an approximate roots of the equations	K2,K3
CO3	Apply the approximate roots of an equation by Horner's and Newton's approximation	K2,K3
CO4	Apply Descarte's rule of signs to find the number of positive and negative roots if any in a polynomial equation	K2,K3,K4
CO5	Analyze the knowledge between roots and co efficient of the polynomial	K1,K2,K5

K1 – Remember; **K2**– Understanding; **K3** – Apply; **K4** – Analyze; **K5** – Evaluate



Syllabus		
Unit	**Content**	**No.of hours**
I	**Summation of Series using Binomial theorem:** Binomial, Exponential theorems, their statements only, their immediate applications **Chapter 3 : Sections 3.5, 3.6, 3.10 & 3.14 , VOL – I** **Chapter 4 : Sections 4.1 to 4.3,4.3.1, VOL- I**	**15**
II	**Logarithmic Series, Convergence and Divergence of Series:** Logarithmic Series theorem-statement and proof-immediate application to summation and approaximations only. Convergency and divergency of Series – Definitions, elementary results - Comparison tests – De -Alembert's and Cauchy's tests. **Chapter 6: Sections 6.1 to 6.14, VOL – I**	**15**
III	**Absolute Convergence of Series:** Absolute convergence – series of positive terms - Cauchy's condensation test- Raabe's test **Chapter 6: Sections 6.15 to 6.19, VOL – I**	**15**
IV	**Theory of equations:** Roots of an equation- Relations connecting the roots and coefficients- transformations of equations-character and position of roots- Descarte's rule of signs-symmetric function of roots-Reciprocal equations. **Chapter 6: Sections 6.20 to 6.24, VOL – I**	**15**
V	**Multiple roots:** Multiple roots -Rolle's theorem - position of real roots of f(x) =0 – Newton's method of approximation to a root – Horner's method. **Chapter 5: Sections 5.1 to 5.18, VOL – II**	**15**
	Total	**75**

Text Book:	
1.	T.K .Manicavachasam Pillai, T.Natarajan & K.S Ganapathy – ***Algebra - Volume I – 2008 & Volume II – 2016*** (S.Viswanatham Printers & Publishers Private Ltd)

Reference Books:	
1.	P. Kandasamy and .Thilagavathy - ***Mathematics for B.Sc. Branch I -Vol. I*** (For B.Sc - I semester) S. Chand and Company Ltd, New Delhi, 2004.
2.	N.P.Bali - ***Algebra*** - Publisher: Laxmi Publications-New Delhi Edition 2010
3.	R.M. Khan - ***Algebra -Classical,Modern, Linear & Boolean***- New central Book Agency(P) Ltd., Kolkata, Reprint 2016
4.	H.S. Hall &S.R.Knight ***Higher Algebra,*** AITBS Publishers, India, Reprint 2014
5.	Erwin Kreyszig ***Advanced Engineering Mathematics,*** Wiley & Sons,United States,2012, 9th Edition.

E-References:	
1	http://www.jjernigan.com/172/ConvergenceDivergence Notes.pdf
2	http://nptel.ac.in/courses/106105162/18
3	https://www.math.nyu.edu/faculty/hausner/congruence.pdf
4	http://sites.millersville.edu/bikenaga/number- theory/wilson- fermet.html

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Mapping Course Outcomes with Programme Outcomes:

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	S	S	M	S	L	S	M
CO2	M	M	S	M	S	L	S	L	S	S
CO3	S	M	M	M	S	M	S	M	L	S
CO4	M	S	M	S	M	L	M	L	S	S
CO5	S	M	M	S	L	S	S	M	M	M

S-Strong; **M**-Medium; **L**-Low

Prepared By
[E. MARAGATHAMBAL]

Verified By
[D. JASMEKHA]

Approved By
[S. DEVI]

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Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	24U1MAC2	CORE -II	5	4	25	75	100
Course Title		CALCULUS					

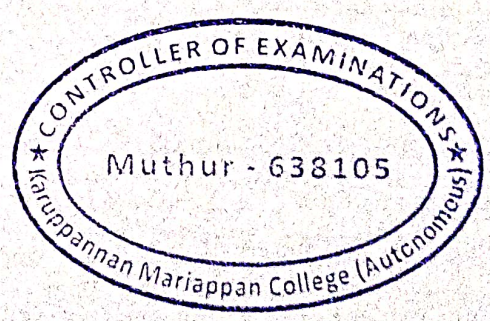
S.NO.	COURSE OBJECTIVES
1	To focus on conceptual understanding
2	To orient the students to get an idea of curvatures
3	To gain complete knowledge of Integration of different types of functions and its geometrical applications
4	To understand the concept of double , triple and improper integrals
5	To prepare students to succeed in upper level maths, science, engineering and other courses which require calculus

COURSE OUTCOMES (COs)

On the successful completion of the course, students will be able to

CO Number	Course Outcomes	Knowledge Level
CO1	Identify areas in Mathematics and other fields where calculus is useful	K1
CO2	Understand the concepts of Evolutes and Envelopes, methods to find curvature and evolutes	K2
CO3	Apply the concept of change of variables in double and triple integrals	K3,K4
CO4	Apply double , triple integral to find the area and volume respectively	K4
CO5	Apply the Beta and gamma function to solve the multiple integrals	K5

K1-Remember; K2-Understanding; K3-Apply; K4- Analyze; K5–Evaluate



Syllabus		
Unit	**Content**	**No of hours**
I	**Differentiation** – Definition – Standard Forms – Logarithmic Differentiation – Differentiation of Implicit Functions – Differentiation of one function with respect to another – Successive Differentiation – Leibnitz formula for the n^{th} derivative of a product (Statements and Problems only). **Chapter- II & III**	**15**
II	**Envelopes** – Radius of curvature in Cartesian and Polar Forms –Centre of curvature – Evolutes and Involutes – Pedal Equations. **Chapter -X**	**15**
III	**Integration** – Integration of the types $dx/(ax^2+bx+c)$, $(lx+m)/(ax^2+bx+c)$, $1/\sqrt{(ax^2+bx+c)}$, $(px+q)/\sqrt{(ax^2+bx+c)}$, $\frac{1}{a+b\cos x}$, $\frac{1}{a+b\sin x}$ and $\frac{1}{(a^2cos^2x+b^2sin^2x)}$ Integration by parts – Reduction formulae – Problems – Bernoulli's formula – Problems. **Chapter I -Sec. 7.3 Rule (b) Type (i) &(ii) , Sec. 8 Case (i) &(ii), Sec. 9, 10, 12, 13, 15**	**15**
IV	**Multiple Integrals** :Evaluation of the double Integral – Double Integral in polar co-ordinates –Triple Integrals–Applications to Calculation Volumes–Volume as a triple integral Jacobian – Change of Variable in the case of two variables–Change of Variable in the case of three variables – Transformation from Cartesian to Polar co-ordinates – Transformation from Cartesian to Spherical co-ordinates. **Chapter-V: Sections** 2.2,3,4,5.3,5.4,6.3 **Chapter-VI: Sections** 1.1,1.2,2.1–2.4	**15**
V	**Improper Integrals:** Infinite Integrals–Simple Problems–Beta and Gamma functions–Their Properties – Relation between them – Evaluation of Multiple Integrals using Beta and Gamma Functions. **Chapter-VII**	**15**
	Total	**75**

Text Books:	
1.	S. Narayanan and T.K.Manicavachagom Pillay - ***Calculus, Vol-I***, S.Viswanatham Printers and Publishers Pvt.Ltd., Chennai, 2015 **(Units I,II)**
2.	S. Narayanan and T.K.Manicavachagom Pillay,***Calculus,Vol- II*** ,S.Viswanatham Printers and Publishers Pvt.Ltd.,Chennai, 2015 **(Units III,IV,V)**

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Reference Books:	
1.	Tom M.Apostol - ***Calculus Vol.1and Vol.2***,John Wiley & Sons United States, 2016,2nd Edition
2.	James Stewart - ***Calculus: Early Transcendentals*** , Thomson Brooks/Cole, USA, 2008,6th Edition
3.	B.S.Grewal - ***Higher Engineering Mathematics***, Khanna Publishers, 2012,42nd Edition
4.	A. Singaravelu & R. Ramaa-***Calculus & Coordinate Geometry of Two-dimension***, Meenakshi Agency 2003 & 1st Edition
5.	P.R. Vittal & V. Malini- ***Calculus,*** Margham Publication, 2012 & 3 rd Edition

E-References:	
1	https://www.khanacademy.org/math/calculus-home
2	https://ocw.mit.edu/courses/mathematics/18-01-single-variable-calculus-fall-2006/video-lectures/
3	http://www.math.odu.edu/~jhh/Volume-1.PDF
4	http://www.math.odu.edu/~jhh/Volume-2.PDF
5	http://nptel.ac.in/courses/111104085/29

Mapping Course Outcomes with Programme Outcomes:

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	S	M	M	M	S	S	M	S	M
CO2	M	M	S	S	S	L	S	L	S	S
CO3	S	M	M	M	S	M	S	M	L	S
CO4	M	S	M	S	S	L	M	L	S	S
CO5	S	S	M	S	S	S	S	L	S	M

S-Strong; M-Medium; L-Low

Prepared By
[D. SASIREKHA]

Verified By
[F. MARIAMTHAMBAL]

Approved By
[S. DEVI]

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TIRUPUR - 638 105.

SEMESTER-II

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	24U2MAC3	CORE –III	5	4	25	75	100
Course Title		DIFFERENTIAL EQUATIONS & LAPLACE TRANSFORMS					

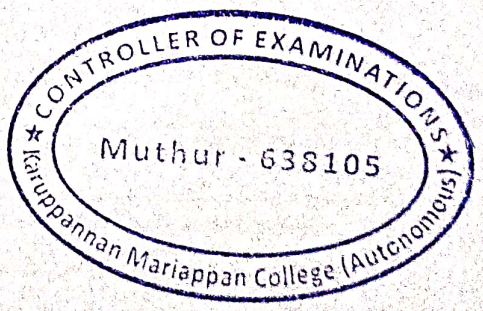
S.NO.	COURSE OBJECTIVES
1	To introduce the basic concepts of linear differential equations with constant and variable coefficients
2	To impart knowledge on the method of solving ordinary differential equations of first order and second order, partial differential equations
3	To study about concepts of Laplace Transforms and applications of Laplace Transforms
4	To get knowledge about Inverse Laplace Transforms to solve the first and second order differential equations with constant coefficients.
5	To improve the student's problem solving skills

COURSE OUTCOMES (COs)

On the successful completion of the course, students will be able to

CO Number	Course Outcomes	Knowledge Level
CO1	Acquire knowledge to solve Differential and Partial Differential Equations.	K1
CO2	Solve higher order linear differential equations.	K2
CO3	Expose differential equation as a powerful tool in solving problems in Physical and Social sciences.	K3
CO4	Demonstrate competency to solve linear PDE by Lagrange's method	K4
CO5	Analyze the concepts of Laplace transform and inverse Laplace transforms to solve ODE with constant coefficients.	K5

K1-Remember; K2-Understanding; K3-Apply; K4- Analyze; K5–Evaluate



Syllabus		
Unit	**Content**	**No.of hours**
I	**First order Ordinary Differential Equations:** First order higher degree equations –Solvable for x, y, p - Clairaut's form - Equation do not contain x and y explicitly–Equations homogeneous in x and y - Simultaneous differential equations of the form dx/P= dy/Q=dz/R. **Chapter 1 : Sections :5 – 7.3 , Chapter 3 : Sections :1 - 4**	**14**
II	**Higher Order Linear Differential Equations:** Finding the solution of Second and Higher Order with constant coefficients with Right Hand Side is of the form Ve^{ax} where V is a function of x – Euler's Homogeneous Linear Differential Equations. **Chapter 2 : Sections :1 – 4, 8, 9 , Chapter 3 : Sections :6**	**16**
III	**Partial Differential Equations:** Formation of equations by eliminating arbitrary constants andarbitrary functions – Definition of general, particular and complete solutions – Singular and general solutions of first order equations in the standard forms (i)f(p,q)=0, (ii) f(z,p,q)=0,(iii) f(x,p) = g(y,q), (iv) z = px+qy+ f(p,q) – Lagrange's method of solving linear differential equations Pp+Qq= R-Charpit's method **Chapter 4 : Sections :1 – 7**	**16**
IV	**Laplace transforms:** Definition – Laplace Transforms of e^{at}, cos at, sin at and tn where n is an Integer-First Shifting Theorem– Laplace Transforms of e^{at} cosbt, e^{at}sinbt and e^{at} t n –Theorems of $L\{f'(t)\}$, $L\{f''(t)\}$, $L\{f^n t)\}$. **Chapter 5 : Sections :1 – 5**	**14**
V	**Inverse Laplace Transforms:** Definition – Solution of Differential Equations with Constant Coefficients using Laplace Transformation – Solving System of Linear Differential Equations using Laplace Transformation. **Chapter 5 : Sections :6 – 9**	**15**
	Total	**75**

Text Book:	
1.	S. Narayanan & T.K.Manicavachagom Pillay ***Calculus Vol. III*** , S. Viswanathan Printers and Publishers Pvt. Ltd., Chennai, Reprint 2015

Reference Books:	
1.	Erwin Kreyszig -***Advanced Engineering Mathematics***-Wiley & Sons, United States 2012, 9 th Edition
2.	N.P. Bali - ***Differential Equations*** - Laxmi Publication Ltd, New Delhi, 2004
3.	Dr. J. K. Goyal and K.P. Gupta - ***Laplace and Fourier Transforms***- PragatiPrakashan Publishers, Meerut, 2000
4.	M. D. Raisinghania- ***Ordinary and Partial Differential Equations*** -S. Chand & Sons, New Delhi 2016, 18th Edition
5.	P Kandasamy, K Thilagavathy ***Allied Mathematics-II*** -S. Chand & Sons, New Delhi, 2004, 2nd Edition

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E-References:	
1	https://nptel.ac.in/courses/111105035/
2	http://www.nptelvideos.in/2012/11/mathematics-iii.html
3	https://www.digimat.in/nptel/courses/video/111108081/L02.html
4	https://www.math.ust.hk/~machas/differential_equations.pdf.
5	https://www.ijsr.net/archive/v2i1/ijsron2013331.pdf

Mapping Course Outcomes with Programme Outcomes:

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	M	S	S	M	S	S	S	S	M
CO2	S	M	S	S	S	L	S	L	S	S
CO3	S	S	M	S	M	M	S	M	L	S
CO4	S	M	S	M	S	L	M	L	S	S
CO5	M	S	S	S	S	S	S	L	S	M

S-Strong; M-Medium; L-Low

Prepared By
[D. SASIREKHA]

Verified By
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Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	24U2MAC4	CORE -IV	5	4	25	75	100
Course Title		TRIGONOMETRY, VECTOR CALCULUS AND FOURIER SERIES					

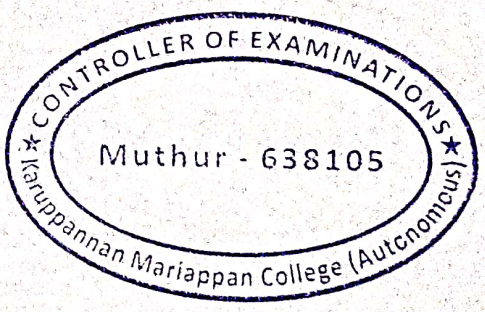
S.NO.	COURSE OBJECTIVES
1	To focus on conceptual understanding
2	To enable the students to learn about the expansion of trigonometric, hyperbolic functions, vector calculus
3	To gain knowledge about divergence, curl and scalar potential
4	To understand and find the expansions of Fourier series of a given periodic function
5	To impart the application of Sine and Cosine functions in signals using Fourier transform

COURSE OUTCOMES (COs)

On the successful completion of the course, students will be able to

CO Number	Course Outcomes	Knowledge Level
CO1	Know the expansion of trigonometric functions and hyperbolic functions	K1
CO2	Acquire the basic knowledge of vector differentiation and vector integration	K2,K3
CO3	Determine and apply the important quantities associated with vector fields such as the divergence, curl and scalar potential	K3
CO4	Understand and find Fourier series of a given periodic function	K3
CO5	Examine line integral, surface integral ,volume integral and inter-relations among them	K4,K5

K1-Remember; K2-Understanding; K3-Apply; K4- Analyze; K5–Evaluate



Syllabus		
Unit	**Content**	**No.of hours**
I	**Expansion in Series** : Expansion in Series – Expansion of **$\cos^n\theta$, $\sin^n\theta$** in a series of cosines and sines of multiples of θ – Expansions of **cosnθ, sinnθ and tannθ** in powers of sines , cosines and tangents – Expansion of sin θ, cos θ and tan θ in powers of θ – hyperbolic functions and inverse hyperbolic functions. **Chapter: 3 - Section: 1,4 , Chapter: 4 - Section: 1,2**	15
II	**Logarithm of complex quantities and summation of series:** Logarithm of complex quantities - summation of series – when angles are in arithmetic progression – C + iS,method of summation – method of differences. **Chapter: 5 - Section: 5, Chapter: 6 - Section: 1,2**	15
III	**Vector Differentiation:** Scalar and vector fields –Differentiation of vectors – Gradient, Divergence and Curl - Solenoidal and irrotational vectors-Laplacian Operator. **Chapter: 1, 2**	15
IV	**Vector Integration**: Integration of vectors – line integral – surface integral – Green's theorem in the plane – Gauss divergence theorem – Stoke's theorem – (Statements only) - verification of the above said theorems. **Chapter: 3**	15
V	**Fourier series:** Periodic functions – Fourier series of periodicity 2π – half range series **Chapter: 6 - Section: 2, 3, 4**	15
	Total	75

Text Books:	
1.	S. Narayanan and T.K.Manicavachagom Pillay -***Trigonometry*** -S.Viswanathan Printers and Publishers Pvt. Ltd., Chennai, 2015 (**Units I, II**)
2.	P.Kandasamy & K.Thilagavathi - ***Mathematics for B.Sc. Branch I, Volume IV first edition*** - S.Chand and Company Ltd, New Delhi, ***2005*** (**Unit III,IV**)
3.	S. Narayanan and T.K.Manicavachagom Pillay- ***Calculus, Vol.III*** S.Viswanathan Printers and Publishers Pvt. Ltd., Chennai, 2015 (**Unit V**)

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Reference Books:	
1.	P.Duraipandian, Laxmiduraipandian –*Vector* **Analysis** - Revised Edition- Reprint 2005, Emerald Publishers.
2.	Peter V.O.Neil -***Advanced Engineering Mathematics***- Cengage Learning India Pvt. Ltd., New Delhi, 2012, 7 th Edition
3.	Robert E Mayer-***Schaum's Outlines Trigonometry***-Tata Mc GrawHill publishing company New Delhi - 2013, 5th edition.
4.	D.C.Das & B.N.. Mukherjee - ***Higher Trigonometry*** - U.N. Dhur & Sons(P) Ltd,1973
5.	M.D.Raisinghania- ***Vector Analysis*** - S.Chand And Co , 1985

E-References:	
1	http://www.math.odu.edu/~jhh/Volume-2.PDF
2	http://www-math.mit.edu/~djk/18_01/chapter20/section03.html
3	https://www.whitman.edu/mathematics/calculus_online/chapter16.html
4	http://www.mecmath.net/calc3book.pdf
5	http://www.nptelvideos.in/2012/11/mathematics-iii.html
6	https://nptel.ac.in/courses/111107108/1

Mapping Course Outcomes with Programme Outcomes:

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	M	M	M	S	M	M	M	M	S
CO2	S	M	S	S	M	S	M	S	S	M
CO3	S	M	S	S	M	S	M	S	S	M
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	M	S	S	S	S	M

S-Strong; M-Medium; L-Low

Prepared By
[S. DEVI]

Verified By
(D. SASIREKHA)

Approved By
[S. DEVI]

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DEPARTMENT OF MATHEMATICS
Karuppannan Mariappan College
Nettiyar Palayam, Muthur

KARUPPANNAN MARIAPPAN COLLEGE(Autonomous)

(For the students admitted from the academic year 2024-2025 and onwards)

ALLIED PAPER

(For B.Sc.,(Mathematics))

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	24U1MAA1	ALLIED- I	6	4	25	75	100
Course Title		MATHEMATICAL STATISTICS-I					

S.NO.	COURSE OBJECTIVE
1	To understand the concepts of probability, random variable, various discrete and continuous random variable
2	To know about the concepts of correlation and regression
3	To understand the knowledge of probability distributions
4	To provide specific knowledge about Curve fitting related problems
5	To improve the student's problem solving skills

COURSE OUTCOMES (COs)

On the successful completion of the course, students will be able to

CO Number	Course Outcomes	Knowledge Level
CO1	Know about the discrete and continuous random variable, Probability mass function, probability density function, Expectation	K1
CO2	Acquire the basic knowledge of Moment generating function and Cumulant generating function, Tchebychev's inequality	K2
CO3	Determine and apply the Binomial, Poisson and Normal distributions and properties	K3
CO4	Understand and find the curve fitting and principles of least squares	K3,K5
CO5	Examine the Probability, Distribution and Curve fitting related problems	K4

K1-Remember; K2-Understanding; K3-Apply; K4- Analyze; K5–Evaluate

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Syllabus		
Unit	Content	No.of Hours
I	**Random variables:** Random variables – discrete and continuous random variables– distribution function – properties probability mass function, probability density function – mathematical expectation– addition and multiplication theorems on expectations **Chapter V : Sections – 5.1 to 5.4-5.4.1,5.4.2,5.4.3** **Chapter VI : Sections – 6.1 to 6.4**	18
II	**Moment generating and cumulant generating & characteristic functions and their properties**: Moment generating and cumulating generating & characteristic functions and their properties, Joint probability distributions-marginal and conditional probability distributions-independence of random variables-transformation of variables (one & two dimensional only).Tchebychev's inequality, weak law of large numbers and central limit theorem **Chapter VI: Sections – 6.10 to 6.15**	18
III	**Probability distributions :** Probability distributions : Binomial, Poisson and Normal distributions and their properties and fitting of distributions. **Chapter VII: Sections – 7 : 7.1-7.2:7.2.1-7.2.10,7.3:7.3.1-7.3.8** **Chapter VIII : Sections – 8.2 : 8.2.1 – 8.2.8**	18
IV	**Curve fitting and principle of least Squares:** Curve fitting and principle of least Squares: fitting of curves of straight line, second degree parabola, power curve and exponential curves-correlation and regression analysis. **Chapter IX : Sections – 9.1 – 9.1.3** **Chapter X : Sections – 10.3:10.3.1-10.3.2,10.6,10.7:10.7.1-10.7.4**	18
V	**Simple problems:** Simple problems related to the above units.	18
	Total	90

Text Book:	
1.	Guptha, S.C & Kapoor,V.K - ***Fundamentals of Mathematical statistics*** – 12th Revised Edition, Sultan Chand & Sons, Educational publishers, New Delhi, 2014.

Reference Books:	
1.	Guptha, S.C & Kapoor.V.K - ***Fundamentals of Applied statistics*** - Sultan Chand & Sons, 4th Revised Edition.
2.	R.S.N. Pillai , Bagavathi – ***Statistics- Third Edition***, S.Chand & Company Ltd, New Delhi, 2012.
3.	Dr. P.R. Vittal- ***Mathematical Statistics***- Margham Publications, Chennai
4.	Prasanna Sahoo-***Probability and Mathematical Statistics***-University of Louisville,USA, 2013
5.	Robert V. Hogg, Joseph W.McKean,Allen T. Craig - ***Introduction to Mathematical Statistics***- Pearson Education Inc. UK 2018, 8 th Edition

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E-References:	
1	http://nptel.ac.in/courses/102106051/4
2	http://nptel.ac.in/courses/108106083/lecture30_CLT.pdf
3	https://www.khanacademy.org/math/statistics-probability/random-variables-stats-library/modal/v/discrete-and-continuous-random-variables
4	http://www.e-booksdirectory.com/details.php?ebook=10166
5	https://www.probabilitycourse.com/
6	http://mason.gmu.edu/~jgentle/books/MathStat.pdf

Mapping Course Outcomes with Programme Outcomes:

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	S	M	M	M	S	S	S	S	M
CO2	M	M	S	S	S	L	S	L	S	S
CO3	S	M	M	M	S	M	S	M	L	S
CO4	M	S	M	S	S	L	M	L	S	S
CO5	S	S	M	S	S	S	S	L	M	M

S-Strong; M-Medium; L-Low

Prepared By
[S. DEVI]

Verified By
[D. SABIREKHA]

Approved By
[S. DEVI]

DEPARTMENT OF MATHEMATICS
Karuppannan Mariappan College
Chettiyar Palayam, Muthur
TIRUPUR - 638 105.

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Muthur - 638105
Karuppannan Mariappan College (Autonomous)

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	24U2MAA2	ALLIED -II	6	4	25	75	100
Course Title		MATHEMATICAL STATISTICS-II					

S.NO.	COURSE OBJECTIVES
1	To understood the concepts of estimation, testing, sampling, design of experiments
2	To provide specific knowledge about methods of estimation and confidence interval
3	To study about concepts of Type I error and II errors
4	To acquire knowledge about sampling errors and analysis of variance
5	To improve the student's problem solving skills

COURSE OUTCOMES (COs)

On the successful completion of the course, students will be able to

CO Number	Course Outcomes	Knowledge Level
CO1	Know about the population, sample, statistics, parameter-point estimation, consistency, unbiasedness, efficiency	K1
CO2	Acquire the basic knowledge of Methods of estimation , maximum likelihood, moments, confidence interval	K2
CO3	Determine and apply Type I error and II errors – power test– Neyman - Pearson Lemma-likelihood ratio tests-concept of most powerful test	K3
CO4	Understand and find Sampling from finite population, standard errors. Sampling and non- sampling errors and Analysis of variance	K3
CO5	Examine and Evaluate the problems from the above units	K4,K5

K1-Remember; K2-Understanding; K3-Apply; K4- Analyze; K5–Evaluate



Syllabus		
Unit	**Content**	**No. of Hours**
I	**Population and estimation**: Concept of population, sample, statistics,parameter-point estimation-concept of point estimation- consistency, unbiasedness, efficiency- sufficiency- Neyman factorization theorem- Cramer Rao inequality - Rao-Blackwell theorem. **Chapter XV: Sections –15.1 – 15.7,15.9**	**18**
II	**Methods of estimation** : Methods of estimation-maximum likelihood, moments, and minimum chi-square –properties- interval estimation–confidence interval-derivation of confidence intervals based normal, t, and chi-square and F. **Chapter XV : Sections –15.10 – 15.15-15.5.1**	**18**
III	**Test of hypothesis**: Type statements and results only). Test of significance-standard error-I error and II errors-power test–Neyman - Pearson Lemma-likelihood ratio tests-concept of most powerful test (r-large sample tests with respect to mean, standard deviation,proportion, difference between means,standard deviations and proportions-exact tests based on t, chi-square and F distributions **Chapter XIV : Sections –14.2.7-14.2.12** **Chapter XVI : Sections: 16.1-16.6,16.7.1-16.7.5**	**18**
IV	**Sampling errors and Analysis of variance:**Sampling -simple random sampling,stratified random sampling and systematic sampling-estimation of mean, total and their standard errors.Sampling and non- sampling errors (concepts only). Analysis of variance: one way, two classifications. **Chapter XII : Sections –12.1-12.2:12.2.1 – 12.2.4** **Chapter V : Sections – 5.1,5.2-5.2.1-5.2.3, 5.3:5.3.1-5.3.3**	**18**
V	**Simple problems:** Simple problems related to the above units	**18**
	Total	**90**

Text Books:	
1.	Guptha,S.C & Kapoor,V.K - ***Fundamentals of mathematical Statistics*** – 10th Revised Edition, Sultan Chand & Sons, Educational publishers, New Delhi, 2014 (**Unit : I,II & III**)
2.	Guptha S.C & Kapoor V.K - ***Fundamentals of Applied statistics***- Sultan Chand & Sons **(Unit IV : Chapter V only)**

Reference Books:	
1.	Presanna Sahoo - ***Probability and Mathematical Statistics***, University of Louisville,USA,2013
2.	Robert V.Hogg, JosephW. McKean, AllenT.Crag - ***Introduction to Mathematical Statistics***, Pearson Education Inc, UK, 2018, 8th Edition
3.	Robert V.Hogg,Elliot A. Tanis, Dale L.Zimmerman -***Probability and Statistical Inference***- Pearson Education Inc,UK, 2015, 9thEdition
4.	Barbara Illowsky, Susan Dean - ***Introductory Statistics*** - Rice University, Texas, 2014 , Last Edition
5.	Kandasamy.P, Thilagavathy.K, Gunavathi.K - ***Probability, Statistics and Queueing Theory*** - S.Chand & Company Ltd, 2014

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E-References:	
1	http://mason.gmu.edu/~jgentle/csi9723/
2	https://minerva.it.manchester.ac.uk/~saralees/statbook2.pdf
3	http://nptel.ac.in/courses/110104085/5
4	https://www.khanacademy.org/math/statistics-probability/inference-categorical-data-chi- square-tests/modal/v/goodness-of-fit-example
5	http://www.e-booksdirectory.com/details.php?ebook=11787

Mapping Course Outcomes with Programme Outcomes:

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	M	S	S	S	S	S	M
CO2	M	S	M	S	M	L	S	L	S	S
CO3	M	S	S	M	S	M	S	M	L	S
CO4	S	M	M	S	S	L	M	L	S	S
CO5	S	M	S	M	S	S	S	L	M	M

S- Strong; M-Medium; L–Low

Prepared By
[S. DEVI]

Verified By
[D. SASIREKHA]

Approved By
[S. DEVI]

DEPARTMENT OF MATHEMATICS
Karuppannan Mariappan College
Chettiyar Palayam, Muthur
TIRUPUR - 638 105.

CONTROLLER OF EXAMINATIONS
Muthur - 638105
Karuppannan Mariappan College (Autonomous)

KARUPPANNAN MARIAPPAN COLLEGE(Autonomous)

(For the students admitted from the academic year 2024-2025 and onwards)

ALLIED PAPER

(For B.Sc.,(CS) & B.Sc.,(IT) & B.C.A)

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	24U1MAA01	ALLIED -I	5	4	25	75	100
Course Title		MATHEMATICS FOR COMPUTER SCIENCE-I					

S.NO.	COURSE OBJECTIVES
1	To provide the students with specific knowledge about matrices and sets.
2	To study about basic concepts of set theory and its applications
3	To understand the basic concepts of relations and types of relations
4	To gain knowledge about graphs and the logical operations in propositional calculus.
5	To improve the student's problem solving skills.

COURSE OUTCOMES(COs):

On the successful completion of the course, students will be able to

CO Number	Course Outcomes	Knowledge Level
CO1	Understand the basic concepts of matrices; remember determinants and evaluate inverse matrix.	K1, K2
CO2	Understand the basic concepts of set theory remember the inclusion and exclusion principles and apply it to solve the real world problems.	K3, K4
CO3	Know the concepts of relations, types, properties, set operations and analyze the problems.	K1, K4
CO4	Understand and remember the concepts of graphs, subgraphs, analyze, apply and evaluate its storage representation in memory.	K1, K2, K3
CO5	Learn the concepts of propositional calculus, remember, analyze and evaluate simple mathematical logical problems.	K2, K4, K5

K1-Remember; K2-Understanding; K3-Apply; K4-Analyze; K5–Evaluate

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SYLLABUS		
Unit	**Content**	**No.of Hours**
I	**MATRICES:** Definition – Types of Matrices – Addition & Subtraction of Matrices – Scalar multiple of a matrix – Matrix Multiplication – Determinant of a Matrix – Inverse of a matrix.	15
II	**SET THEORY:** Introduction – Sets & its Elements – Set Description Types of Sets – Basic set operations – Laws of set theory – Duality – The inclusion & exclusion principle	15
III	**RELATIONS:** Introduction – Definition of Cartesian Product of sets – Binary relation – Set operations on relations – Types of relations – Partial Order Relation – Equivalence Relations – Composition of relations.	15
IV	**GRAPH THEORY:** Introduction – Definition of Graph, Undirected Graph, Multi Graph, Walk, Path, Circuit, Connected Graphs, Distance & Diameter, Cut Points & Bridges – Types of Graphs – Sub graph	15
V	**MATHEMATICAL LOGIC:** Introduction – Propositional calculus – Basic Logical Operations: Conjunction, Disjunction, Negation, Conditional Statements, and Bi conditional statements – Tautologies – Contradiction – Algebra of statements.	15
	Total	75

Text Books:	
1.	Dr M.K. Venkataraman - ***Engineering Mathematics, Volume II*** - National Publishing Company, Chennai. 5th Edition 2004, Reprint 2006 **(Unit I)**
2.	J.K Sharma - ***Discrete Mathematics*** - MacMillan India Ltd., 3rd Edition, 2013. **(Unit II-V).**

Reference Books:	
1.	A.R.Vasishtha, A.K.Vasishtha – ***Matrices*** - Krishna Prakashan Media (P) Ltd, Forty sixth 11thEdition, 2014.
2.	T.Veerarajan - ***Discrete Mathematics with Graph Theory and Combinatorics*** - Tata McGraw Hill Education Pvt Ltd., First Edition, 2007.
3.	P.R.Vittal-***Statistics***- Margham Publishers,Chennai, 2012, 6th Edition
4.	Erwin Kreyszig- ***Advanced Engineering Mathematics***-John Wiley & Sons Inc. 2011, 9th Edition
5.	P.A.Navnitham - ***Business Mathematics and Statistics*** -Jai Publishers, Trichy, 2012,1st Edition

E-References:	
1.	https://en.wikipedia.org/wiki/The_Matrix
2.	https://www.geeksforgeeks.org/set-theory/
3.	https://www.cs.odu.edu/~cs381/cs381content/relation/order/order.html
4.	https://en.wikipedia.org/wiki/Graph_theory

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Karpagam Academy of Higher Education (Deemed to be University)

Mapping Course Outcomes with Programme Outcomes:

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	S	M	S	S	M	S	M	S
CO2	S	S	S	M	S	S	S	S	M	S
CO3	S	M	M	M	M	S	M	M	M	M
CO4	M	M	S	S	M	M	M	S	S	M
CO5	S	S	M	M	S	S	S	M	M	S

M-Medium; L –Low

D. Sasi

Prepared By

[D. SASIREKHA]

E.Mal

Verified By

[E.MARIAYATHAMBAL]

[S. DEVI]

Approved By

[S. DEVI]

DEPARTMENT OF MATHEMATICS
Karuppannan Mariappan College
Chettiyar Palayam, Muthur
TIRUPUR - 638 105.

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Karuppannan Mariappan College (Autonomous)

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	24U2MAA02	ALLIED -II	4	4	25	75	100

Course Title	MATHEMATICS FOR COMPUTER SCIENCE-II

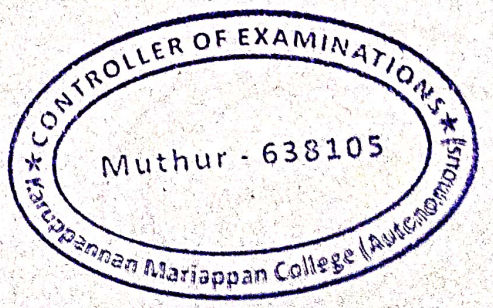
S.NO.	COURSE OBJECTIVES
1	To enhance the problem solving skills to find the roots of linear and non-linear equations.
2	To work with computer oriented statistical problems.
3	To understand various types of measures and statistical methods.
4	To provide knowledge about Measures of dispersion
5	To gain numerical problem solving skills.

COURSE OUTCOMES (COs):

On the successful completion of the course, students will be able to

CO Number	Course Outcomes	Knowledge Level
CO1	Understand the basics of numerical Algebraic and Transcendental Equations; remember and solve the problems	K1, K2
CO2	Understand and solve simultaneous Linear Algebraic Equations using various methods.	K3
CO3	Choose formulate and implement appropriate numerical methods for solving integration problems.	K1, K4
CO4	Understand the basic statistical parameters and calculate Mean, Median and Mode for the tabulated data	K2
CO5	Calculate Measures of Dispersion.	K5

K1-Remember; K2-Understanding; K3-Apply; K4-Analyze; K5–Evaluate



SYLLABUS

Unit	Content	No. of Hours
I	**The Solution of Numerical Algebraic and Transcendental Equations:** Bisection method – Iteration Method – Newton- Raphson method – The method of false position.	12
II	**System of Simultaneous Linear algebraic Equation** – Gauss elimination, Gauss Jordon, Gauss Seidal methods	12
III	**Numerical Integration** – Trapezoidal rule – Simpson's One –third rule – Simpson's three – eighths rule.	12
IV	**Statistics:** Definition – Classification and Tabulation of Data – Measures of Central values: Mean – Median – Mode –Their Relationship – Problems.	12
V	**Measures of Dispersion:** Range – Quartile Deviation - Mean Deviation – Standard Deviation.	12
	Total	**60**

Text Books:	
1.	P. Kandasamy, K.Thilagavathi, K.Gunavathi- ***Numerical Methods***- Chand & Company Ltd, New Delhi, First edition 1997, Reprint 2022. **(Unit I-III)**
2.	R.S.N.Pillai, Bagavathi - ***Statistics, Third Edition***, S.Chand & Company Ltd, New Delhi, 2012. **(Unit- IV, V)**

Reference Books:	
1.	E. Balagurusamy - ***Numerical Methods***-Tata McGraw Hill.
2.	S. C. Gupta, V. K. Kapoor - ***Fundamental of Mathematical Statistics***- Sultan Chand & Sons
3.	C.B.Gupta, Vijay Gupta - ***An Introduction to Statistical Methods*** - Vikas Publishing House Pvt. Ltd, Twenty Third Revised Edition, 2013
4.	N.G.Das & J.K.Das - ***Business Mathematics and Statistics***- McGraw Hill Education, 2017, 1st Edition
5.	P.R.Vittal - ***Statistics***- Margham Publications,Chennai, 2012, 6th Edition

E-References:	
1.	https://onlinecourses.nptel.ac.in/noc18_ma03/preview
2.	https://www.thoughtco.com/what-is-statistics
3.	https://explorable.com/course/statistics-beginners-guide

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Mapping Course Outcomes with Programme Outcomes:

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	M	S	S	M	S	M
CO2	S	S	S	S	M	L	S	L	S	S
CO3	M	M	M	S	S	M	S	M	L	S
CO4	S	M	M	M	S	L	M	L	S	S
CO5	S	M	S	S	S	S	S	L	L	M

M-Medium; L –Low

Prepared By
[D. SASIREKHA]

Verified By
[E. MARIMUTHAMBAL]

Approved By
[S. DEVI]

DEPARTMENT OF MATHEMATICS
Karuppannan Mariappan College
Chettiyar Palayam, Muthur
TIRUPUR - 638 105.

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Muthur - 638105
Karuppannan Mariappan College (Autonomous)

KARUPPANNAN MARIAPPAN COLLEGE(Autonomous)

(For the students admitted from the academic year 2024-2025 and onwards)

ALLIED PAPER

(For BBA Students)

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	24U1MAA04	ALLIED- I	6	4	25	75	100
Course Title		BUSINESS MATHEMATICS & STATISTICS					

S.NO.	COURSE OBJECTIVES
1	To introduce some of the ideas of business calculus and financial mathematics,.
2	To emphasize the applications of financial mathematics methods in the business scenario
3	To acquire knowledge about simple and compound interest, annuities and discounting.
4	To compute the sampling distributions, sampling distributions of dispersion and also time series
5	To improve problem solving skills

COURSE OUTCOMES(COs):

On the successful completion of the course, the students will be able to

CO Number	Course Outcomes	Knowledge Level
CO1	Apply the knowledge of matrices in solving business problems	K1,K5
CO2	Students will have a sound knowledge of set theoretic language and be able to use it to modify mathematical objects and how to identify the inconsistency of data in business situation.	K1,K2,K3
CO3	Analyze real world scenarios to recognize when simple and compound interest, annuities and discounting.	K1,K2, K5
CO4	Outline the meaning of marginal revenue and marginal cost and their relevance for firm's profitability.	K2,K3, K5
CO5	Understand and compute the sampling distributions, sampling distributions of dispersion and also time series	K3,K4,K5

K1–Remember; K2–Understanding; K3–Apply; K4–Analyze; K5–Evaluate

CONTROLLER OF EXAMINATIONS
Muthur - 638105
Karuppannan Mariappan College (Autonomous)

SYLLABUS		
Unit	Content	No. of Hours
I	**Matrices:** Definition - Types - Matrix operations -Determinants - Minor - Co factor - adjoint - Inverse of a matrix (not more than 3rd order) - Solving system of simultaneous linear equations - Cramer's rule - Inverse matrix method.	18
II	**Set theory:** Types of sets - Set operations - Venn diagrams and its applications - Laws and properties of sets - Number of elements - Inconsistency of data.	18
III	**Mathematics of finance:** Simple and compound interest - Effective and Nominal rate of interest - Annuities Discounting. (simple problems only)	18
IV	**Statistics:** Definition - Characteristics - Scope - Limitations - Measures of central tendency - Arithmetic mean - Median - Mode -Geometric mean - Harmonic mean.	18
V	**Measures of Dispersion:** Range-Quartile Deviation-Mean Deviation- Standard Deviation-Co-efficient of Variation-Time series-Components of Time series.	18
	Total	90

Note: Theory and problems may be in the Ratio 20% and 80% respectively.

Text Book:	
1.	P.A. Navanitham - ***Business Mathematics and Statistics*** - Jai Publishers - 2004

Reference Books:	
1.	S.P.Gupta - ***Statistical Methods*** - Sultan Chand &Sons, 34th Edition,2007.
2.	P.R.Vittal - ***Business Mathematics*** - Margham publications 2nd edition,2003.
3.	R.S.N Pillai, Bagavathi-***Statistics: Theory and Practice*** -Sultan Chand & Co., New Delhi, Reprint 2015
4.	Snodecor G.W and Cochran W.G -***Statistical Methods***-Oxford Press ,1967
5.	A.R.Vasishtha, A.K.Vasishtha – ***Matrices*** - Krishna Prakashan Media (P) Ltd, Forty sixth 11thEdition, 2014.

E-References:	
1.	https://byjus.com/jee/matrices
2.	https://www.patreon.com/patrickjmt
3.	https://web2.slc.qc.ca/pcamire/set
4.	https://bit.ly/2yZbjC

CONTROLLER OF EXAMINATIONS
Muthur - 638105
Karuppannan Mariappan College (Autonomous)

Mapping Course Outcomes with Programme Outcomes:

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	M	S	M	S	S	M	S	M
CO2	S	S	S	S	M	L	S	L	S	S
CO3	S	S	S	S	S	M	S	M	L	S
CO4	M	S	S	S	S	L	M	L	S	S
CO5	S	S	S	M	S	S	S	L	S	M

S-Strong; M-Medium; L-Low

Prepared By
[E.MARAIATHAMBAL]

Verified By
[D. SASIREKHA]

Approved By
[S. DEVI]

CONTROLLER OF EXAMINATIONS
Muthur - 638105
Karuppannan Mariappan College (Autonomous)

DEPARTMENT OF MATHEMATICS
Karuppannan Mariappan College
Chettiyar Palayam, Muthur
TIRUPUR

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	24U2MAA05	ALLIED- II	6	4	25	75	100
Course Title	QUANTITATIVE TECHNIQUES FOR MANAGEMENT						

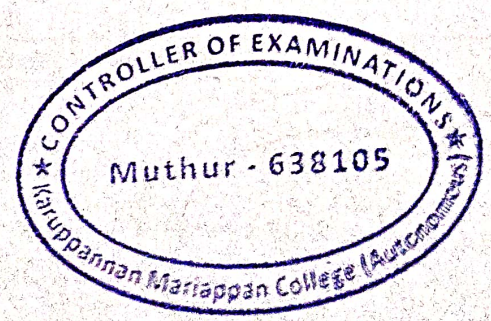
S.NO.	COURSE OBJECTIVES
1	To provide a basic knowledge about operations research.
2	To acquaint the students some common operations Research Tools for various Business decision situations
3	To understand networking concept in making decisions related to projects.
4	To get knowledge about real life application of Linear Programming Problem
5	To understand concept of Transportation and Assignment problems

COURSE OUTCOMES (COs):

On the successful completion of the course, the students will be able to

CO Number	Course Outcomes	Knowledge Level
CO1	Acquaint students with concept of operations research and its applications	K1
CO2	Apply linear programming problem in decision making	K1,K2,K3
CO3	Recognize the use of transportation problem to make decision	K1,K2, K5
CO4	Recognize the use of assignment problem to make decision	K2,K3, K5
CO5	Apply Networking concept in making decisions related to projects.	K3,K4,K5

K1–Remember; K2–Understanding; K3–Apply; K4–Analyze; K5–Evaluate



SYLLABUS

Unit	Content	No. of Hours
I	**Operations Research**: Concept -- Meaning and Definition – Historical Development of OR – characteristics of OR – Scope & Objectives of OR – Phases of OR – Formulation of LPP—Objective Function and constraints of LPP.	18
II	**Linear programming problem**: Solution to LPP - Graphical method and Simplex method – Advantages & Disadvantages of LPP.	18
III	**Transportation problem**: Structure of Transportation problem – IBFS using North West Corner Method (NWCM) – Least Cost Method (LCM) – Vogel's Approximation method (VAM), unbalanced TP, Degeneracy in TP- concept (Simple problems only) – MODI Method.	18
IV	**Assignment problem:** Mathematical formulation of the problem – Hungarian Assignment method – Travelling salesman problem – Maximization problem – Unbalanced Assignment problem.	18
V	**Network Analysis:** Meaning and Objectives – Managerial applications of Network Techniques — Difference between PERT & CPM - Network fundamentals- Construction of Network diagram –Fulkerson's rules –Finding of critical path & Estimated Duration – Time estimates in PERT – Steps involved in PERT calculations – (only simple problems)	18
	Total	**90**

Note: Theory and problems may be in the Ratio 20% and 80% respectively.

Text Books:

1. Sharma.J.K- ***Operations Research- Theory and Applications***- Laxmi Publications,5th Edition, 2013.

Reference Books:

1. Sharma.S.D - ***Operations Research*** – Kedar Nath, Ram Nath, 2008
2. Kanti swarup, P.K. Gupta and Man Mohan, ***Operations Research***, Sultan Chand & Sons, NewDelhi, 19th Edition, 2017.
3. Hamdy A. Taha, ***Operations Research an Introduction***, Pearson Publications, India, 9th Edition, 2016.
4. Harrey M. Wagner, ***Principles of operations research with applications to Managerial Decisions***, PHI Learning Private Limited, New Delhi, 2nd Edition,2010.
5. P.K.Gupta, Man Mohan, Kanti Swarup - ***Operations Research***- Sultan Chand & Sons, 2007

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Muthur - 638105
Karuppannan Mariappan College (Autonomous)

E-References:	
1.	https://simplesnippets.tech/linearprorammingproblem#LPP
2.	https://youtu.be/fSuqTgnCVRg
3.	https://simplesnippets.tech/graphicalsolution#operations research
4.	https://Binghamton.edu/seorl

Mapping Course Outcomes with Programme Outcomes:

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	M	S	M	S	S	M	S	M
CO2	S	S	S	S	M	L	S	L	S	S
CO3	S	S	S	S	S	M	S	M	L	S
CO4	M	S	S	S	S	L	M	L	S	S
CO5	S	S	S	M	S	S	S	L	S	M

S-Strong; M-Medium; L-Low

Prepared By
[E.MARAIATHAMBAL]

Verified By
[D.SASIREKHA]

Approved By
[S.DEVI]

CONTROLLER OF EXAMINATIONS
Muthur - 638105
Karuppannan Mariappan College (Autonomous)

DEPARTMENT OF MATHEMATICS
Karuppannan Mariappan College
Chettiyar Palayam, Muthur
TIRUPUR - 638 105.

KARUPPANNAN MARIAPPAN COLLEGE(Autonomous)

(For the students admitted from the academic year 2024-2025 and onwards)

ALLIED PAPER

(For B.Com and B.Com(P.A) Students)

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I/III	24UIMAA06 / 24U3MAA06	ALLIED –I / III	4	3	20	55	75

Course Title	BUSINESS MATHEMATICS

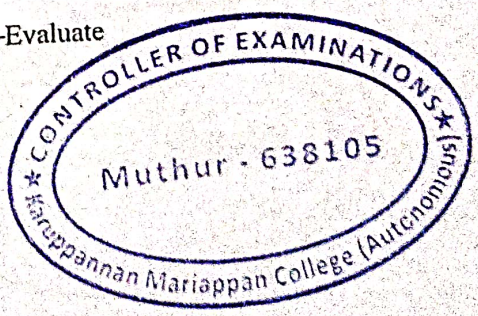
S.NO.	COURSE OBJECTIVES
1	To understand the basics of applications of mathematics in business.
2	To make the students to be ready for solving business problems using mathematical operations
3	To provide an insight knowledge about variables, constants and functions.
4	To provide the concept of operations research and its applications
5	To get basic knowledge of integral calculus, definite and indefinite functions

COURSE OUTCOME(COs):

On successful completion of this course, the students would be able to:

CO Number	Course Outcomes	Knowledge Level
CO1	Understand the basic concepts of arithmetic and geometric series and different effective rates of interest for sinking fund, annuity and present value.	K1,K2
CO2	Know the basic concepts of addition and multiplication analysis and input and output analysis.	K2,K3
CO3	Aware of variables, constants and functions and evaluate the first and second order derivatives.	K1,K4
CO4	Gain knowledge on integral calculus and determining definite and indefinite functions.	K2,K5
CO5	Acquaint students with concept of operations research and its applications.	K2,K3

K1-Remember; K2-Understanding; K3-Apply; K4-Analyze; K5–Evaluate



SYLLABUS

Unit	Contents	No.of Hours
I	Set Theory–Arithmetic and Geometric Series–Simple and Compound Interest – Effective rate of Interest –Sinking Fund – Annuity - Present Value – Discounting of Bills – True Discount – Banker's Gain.	12
II	Matrix: Basic Concepts – Addition and Multiplication of Matrices – Inverse of a Matrix – Rank of Matrix - Solution of Simultaneous Linear Equations – Input Output Analysis.	12
III	Variables, Constants and Functions – Limits of Algebraic Functions – Simple Differentiation of Algebraic Functions –Meaning of Derivations –Evaluation of First and Second Order Derivatives – Maxima and Minima – Application to Business Problems	12
IV	Elementary Integral Calculus – Determining Indefinite and Definite Integrals of simple Functions – Integration by Parts	12
V	Linear Programming Problem–Formation–Solution by Graphical Method Solution by Simplex Method	12
	Total	**60**

Text Book:

1. Navanitham,P.A,*"Business Mathematics & Statistics"* Jai Publishers,Trichy- 21 June 2004

Reference Books:

1. G.K.Ranganath,C.S.Sampamgiram&Y.Rajan-*A Text book of Business Mathematics*–Himalaya Publishing House.
2. Sanchetti D.C and Kapoor,V.K,*"Business Mathematics"*,Sultan and Chand Co & Ltd, New Delhi
3. Sundaresan and Jayaseelan ,*"Introduction to Business Mathematics"*, Sultan Chand Co & Ltd, New Delhi, 1st edition 1999
4. S.P.Gupta - ***Statistical Methods*** - Sultan Chand &Sons, 34th Edition,2007.
5. P.R.Vittal - ***Business Mathematics*** - Margham publications 2nd edition,2003.

E-References:

1. https://www.patreon.com/patrickjmt
2. https://web2.slc.qc.ca/pcamire/set
3. https://bit.ly/2yZbjC

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Kalaignarkarunanidhi Institute of Technology (Autonomous)

Mapping Course Outcomes with Programme Outcomes:

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	S	M	S	M	M	S	S
CO2	S	S	M	S	S	S	M	L	L	S
CO3	M	S	S	S	S	S	L	M	S	M
CO4	S	S	S	M	M	S	S	S	M	M
CO5	M	M	S	S	S	M	M	S	M	S

S-Strong, M-Medium, L-Low

Prepared By
[S. DEVI]

Verified By
[D. SASIREKHA]

Approved By
[S. DEVI]

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Muthur - 638105
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DEPARTMENT OF MATHEMATICS
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TIRUPUR - 638 105.

KARUPPANNAN MARIAPPAN COLLEGE(Autonomous)

(For the students admitted from the academic year 2024-2025 and onwards)

FOUNDATION COURSE

FOR UNDER GRADUATE COURSES OF ALL BRANCHES OF HIGHER EDUCATION

SEMESTER-II

nester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	24U2VE2	FOUNDATION SUBJECT - B	2	2	-	50	50

Course Title	HUMAN RIGHTS

Syllabus

nit	Content	No.of hours
I	**Concept of Human Values, Value Education Towards Personal Development :** Aim of education and value education; Evolution of value oriented education; Concept of Human values; types of values; Components of value education. **Personal Development :** Self analysis and introspection; sensitization towards gender equality, physically challenged, intellectually challenged. Respect to - age, experience, maturity, family members, neighbours, co-workers. **Character Formation Towards Positive Personality:** Truthfulness, Constructivity, Sacrifice, Sincerity, Self Control, Altruism, Tolerance, Scientific Vision.	6
II	**Value Education Towards National and Global Development:** **National and International Values:** Constitutional or national values - Democracy, socialism, secularism, equality, justice, liberty, freedom and fraternity. Social Values - Pity and probity, self control, universal brotherhood. Professional Values - Knowledge thirst, sincerity in profession, regularity, punctuality and faith. Religious Values - Tolerance, wisdom, character. Aesthetic values - Love and appreciation of literature and fine arts and	6

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	respect for the same. National Integration and international understanding.	
III	**Impact of Global Development on Ethics and Values:** Conflict of cross-cultural influences, mass media, cross-border education, materialistic values, professional challenges and compromise. Modern Challenges of Adolescent Emotions and behavior; Sex and spirituality: Comparision and competition; positive and negative thoughts. Adolescent Emotions, arrogance, anger, sexual instability, selfishness.	6
IV	**Theraupatic Measures:** Control of the mind through a. Simplified physical exercise b. Meditation – Objectives, types, effect on body, mind and soul c. Yoga – Objectives, Types, Asanas d. Activities: (i) Moralisation of Desires (ii) Neutralisation of Anger (iii)Eradication of Worries (iv) Benefits of Blessings	6
V	**Human Rights** 1. Concept of Human Rights – Indian and International Perspectives a. Evolution of Human Rights b. Definitions under Indian and International documents 2. Broad classification of Human Rights and Relevant Constitutional Provisions. a. Right to Life, Liberty and Dignity b. Right to Equality c. Right against Exploitation d. Cultural and Educational Rights e. Economic Rights f. Political Rights g. Social Rights 3. Human Rights of Women and Children a. Social Practice and Constitutional Safeguards (i) Female Foeticide and Infanticide (ii) Physical assault and harassment (iii) Domestic violence (iv) Conditions of Working Women 4. Institutions for Implementation a. Human Rights Commission b. Judiciary 5. Violations and Redressel a. Violation by State b. Violation by Individuals c. Nuclear Weapons and terrorism d. Safeguards.	6
	Total	30

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