E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI – 625 014.

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DEPARTMENT OF MATHEMATICS

CBCS SYLLABUS

BACHELOR OF SCIENCE

PROGRAMME CODE - M

COURSE STRUCTURE

(w.e.f. 2021 – 2022 Batch onwards)

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CRITERION - I

1.1.3 Details of courses offered by the institution that focus on employability / entrepreneurship / skill development during the year.

Syllabus copies with highlights of contents focusing on Employability / Entrepreneurship / Skill Development

To be Noted:

HIGHLIGHTED COLORS	COURSES
	Employability
	Skill Development
	Entrepreneurship
	Skilled & Employability

Annexure - 5

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DEPARTMENT OF MATHEMATICS - UG

(w.e.f. 2021- 2022 onwards)

Sem	Part	Sub Code	Title of the Paper	Lecture Hours Per Week	Exam Hours	Marks allotted			
						C.A	S.E	total	credit
V	III	21M51	**Core : Modern Analysis**	5	3	25	75	100	5
	III	21M52	**Core : Statistics – I**	5	3	25	75	100	4
	III	21M53	**Core : Dynamics**	4	3	25	75	100	4
	III		**Core : Elective - III**	4	3	25	75	100	4
	III	21AA51	**Allied II : Programming in C**	4	3	25	75	100	4
	III	21AA5P	**Allied II : C Practical**	2	3	40	60	100	1
	IV	21SEM51	**Skill Based Elective : Vector Calculus**	2	2	25	75	100	2
	IV	21SEM52	**Skill Based Elective : Quantitative Aptitude**	2	2	25	75	100	2
	IV	214EV5	Environmental Studies	2	2	25	75	100	2
VI	III	21M61	**Core : Complex Analysis**	6	3	25	75	100	5
	III	21M62	**Core : Statistics – II**	6	3	25	75	100	5
	III	21M63	**Core : Numerical Methods**	6	3	25	75	100	4
	III	21AA61	**Allied II : Object Oriented Programming with C++**	4	3	25	75	100	4
	III	21AA6P	**Allied II : C ++ Practical**	2	3	40	60	100	1
	IV	21SEM61	**Skill Based Elective : Discrete Mathematics**	2	2	25	75	100	2
	IV	21SEM62	**Skill Based Elective : Combinatorics**	2	2	25	75	100	2
	IV	214VE6	Value Education	2	2	25	75	100	2
	V	215NS4/215PE4	**Extension Activities** : N.S.S / Physical Education	-	2	25	75	100	1

Note:

"*" Offered to Other Departments.

Annexure - 5

ELECTIVE PAPERS

Elective – III is to be chosen in semester V from the following:

1. Linear Algebra – 21ME5A
2. Fuzzy Sets – 21ME5B

Annexure - 5

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DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS
(w.e.f. 2021- 2022 Batch onwards)

Title of the paper : Modern Analysis
Semester : V **Contact Hours :5**
Sub Code :21M51 **Credits :5**

Objectives:

1.To visualize the structure of real number system as a Metric space.

2. To study Connected subsets and Compact subsets of R.

Unit : I

Countable Sets - Uncountable Sets – Inequalities of Holder and Minkowski - **Metric Spaces** - Definitions and Examples – Bounded Sets in a Metric space - Open Ball (Open Sphere) in a Metric Space – Open Sets – Subspace - Interior of a set .

Unit : II

Closed Sets – Closure - Limit Point - Dense Sets – **Complete Metric Spaces**- Completeness - Baire's Category Theorem.

Unit : III

Continuity – Continuity - Homeomorphism – Uniform Continuity.

Unit : IV

Connectedness - Definition and Examples - Connected Subsets of R - Connectedness and Continuity

Unit :V

Compactness –Compact Metric Spaces - Compact Subsets of R – Equivalent Characterizations for Compactness - Compactness and Continuity.

Annexure - 5

Text Book: -

S. Arumugam and A . Thangapandi Isaac,
Modern Analysis,
New Gamma Publishing House, Palayamkotai (2012).

Chapters:-

Unit – I : Chapter 1: Sections (1.2 to 1.4)
Chapter 2: Sections (2.1 to 2.6)
Unit – II : Chapter 2: Sections (2.7 to 2.10)
Chapter 3: Sections (3.1 & 3.2)
Unit – III : Chapter 4: Sections (4.1 to 4.3)
Unit – IV : Chapter 5: Sections (5.1 to 5.3)
Unit – V : Chapter 6: Sections (6.1 to 6.4)

Reference Books:-

1. Chandrasekhara Rao K., Narayanan K.S.,*Real Analysis –Volume II* Viswanathan Printers 2008

2. Richard R. Goldberg,*Methods of real Analysis*, Oxford & IBH Publishing Co. PVT., LTD. (1970).

3. Prof. Venkatachalapathy S.G.,M.Sc.,*Real Analysis* 2006,Margham Publications (2^{nd} Edition)

Annexure - 5

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DEPARTMENT OF MATHEMATICS

B.Sc MATHEMATICS

(w.e.f. 2021 - 2022 Batch onwards)

Title of the paper	**: Statistics - I**	
Semester	**: V**	**Contact Hours : 5**
Sub Code	**: 21M52**	**Credits :4**

Objectives:

1. To Understand and apply foundational statistical theory and methods.
2. To apply statistical method to real data.

Unit : I

Moments, Skewness and Kurtosis: Moments – Skewness and Kurtosis – **Curve Fitting** – Principle of least squares .

Unit :II

Correlation and Regression: Correlation – Rank Correlation – Regression – Correlation Co-Efficient for a Bivariate Frequency Distribution.

Unit :III

Theory of Attributes: Attributes- Consistency of data – Independence and Association of data.

Unit – IV

Index Number: Index Numbers – Consumer Price Index Number (cost of living index numbers).

Unit – V

Probability: Probability – Conditional Probability.

Annexure - 5

Text Book: -

Statistics S. Arumugam and A. Thangapandi Isaac,

New Gamma Publishing House, Palayamkottai (July 2011)

Chapters:-

Unit I : Chapter 4 : Sections (4.1 to 4.2) & Chapter 5

Unit II : Chapter 6 : Sections (6.1 to 6.4)

Unit III : Chapter 8 : Sections (8.1 to 8.3)

Unit IV : Chapter 9 : Sections (9.1 to 9.2)

Unit V : Chapter 11 : Sections (11.1 to 11.2)

Reference Books :-

1. Dr. Gupta S.P., *Statistical methods*, Sultan Chand & Sons, Educational Publishers,New Delhi (2008).

2. Pillai R.S.N., Bagavathi V., *Statistics*, 7th Edition, S. Chand and Company Ltd(2014).

3. Veerarajan T., *Probability, Statistics and Random Processes*, 3rd Edition, Tata McGraw Hill Education Pvt Ltd.

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DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS
(w.e.f. 2021- 2022 Batch Onwards)

Title of the paper	**: Dynamics**	
Semester	**: V**	**Contact Hours : 4**
Sub Code	**: 21M53**	**Credits : 4**

Objective:

1)To analyze the path of a moving particle under specific conditions.

2) To know about motion under the action of central force.

Unit : I

Projectiles – Definitions – Two fundamental principles – Path of a Projectile is a parabola – Characteristics of the motion of a projectile - To determine when the horizontal range of a projectile is maximum, given the magnitude u of the velocity of projection – To show that, for a given initial velocity of projection there are, in general to possible directions of projections so as to obtain a given horizontal range.

(with examples)

Unit : II

Projectiles -To find the velocity of the projectile in magnitude and direction at the end of time t – To show that , The velocity at any point p of a projectile is equal in magnitude to the velocity acquire in falling freely from the directrix to the point – Given the magnitude of the velocity of projection, to show that there are two direction of projection for the particle so as to reach a given point – Range on an inclined plane – To find , The greatest distance of the projectile from the inclined plane and show that is attained in the half the total time of flight – To determine when the range on the inclined plane is maximum, given the

magnitude u of the velocity of projection – To show that, For a given initial velocity of projection, there are, in general, two possible directions of projection so as to obtain a given range on an inclined plane – Motion on the surface of a smooth inclined plane.(with examples)

Unit :III

Collision of Elastic Bodies – Definitions – Fundamental laws of impact – Impact on the smooth sphere on a fixed smooth plane – Direct impact of two smooth spheres – Laws of kinetic energy due to direct impact of two smooth spheres – Oblique impact of two smooth spheres – Laws of kinetic energy due to oblique impact of two smooth sphere.(with examples)

Unit : IV

Simple Harmonic Motions – Simple Harmonic Motion in a Straight line – General solution of S.H.M Equation – Geometrical Representation of a Simple Harmonic Motion – Change of origin - Composition of two Simple Harmonic Motion of the same period and in same straight line – Composition of two Simple Harmonic Motion of the same period in two perpendicular directions.(with examples)

Unit : V

Motion under the action of Central Forces – Velocity and Acceleration in Polar Co-ordinates – Equation of Motion in Polar Coordinates – Note on the equiangular spiral – Differential Equation of central orbits – Perpendicular from the pole on the tangent formulae in polar coordinates – Pedal equation of the central orbit. (with examples)

Text Book:-

M.K. Venkatarama, *Dynamics*, 13th Edition, Agasthiar Publications (2010).

Chapters:-

Unit I : Chapter 6 : Sections (6.1 to 6.5 & 6.7,6.8) (with examples)

Unit II: Chapter 6 : Sections (6.9 to 6.16)(with examples)

Unit III: Chapter 8 : Sections (8.1 to 8.8)(with examples)

Unit IV: Chapter 10: Sections (10.1 to 10.7)(with examples)

Unit V: Chapter 11: Sections (11.4 & 11.6 to 11.8)(with examples)

Annexure - 5

Reference Books:-

1. Khanna M.L.,*Dynamics*,7th Edition,Jai Prakash Nath & Co,Garth Road, Meerut

2. Ramsey A.S., *Dynamics Part I*(First Indian Edition -1985), CBS Publishers & Distributors (2002).

3. Venkatachalapathy S.G . *Mechanics*, margham publications -2007

Annexure - 5

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DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS
(w.e.f. 2021- 2022 Batch onwards)

Title of the paper	**: Linear Algebra**		
Semester	**: V**	**Contact Hours**	**:4**
Sub Code	**:21ME5A**	**Credits**	**:4**

Objective :

1)To understand the concept of vector spaces.

2) To know more about matrices.

Unit: I

Vector Spaces: Definition and Examples – Subspaces - Linear Transformations.

Unit: II

Vector Spaces: Span of a set - Linear Independence - Basis and Dimension - Rank and Nullity - Matrix of a Linear Transformation.

Unit: III

Inner Product Space: Definition and Examples – Orthogonality -Orthogonal Complement.

Unit: IV

Theory of Matrices: Algebra of Matrices – Types of Matrices – The Inverse of Matrix.

Unit: V

Theory of Matrices: Elementary Transformations – Rank of a Matrix– Simultaneous Linear Equations – Characteristic Equation And Cayley Hamilton Theorem - Eigen Values And Eigen Vectors

Annexure - 5

Text Book: -

S. Arumugam and A . Thangapandi Isaac, *Modern Algebra,*

SCITECH Publications (INDIA) Pvt.,Ltd (2003).

Chapters:-

Unit I: Chapter 5: Sections (5.1 to 5.3)

Unit II: Chapter 5: Sections (5.4 to 5.8)

Unit III: Chapter 6: Sections (6.1 to 6.3)

Unit IV: Chapter 7: Sections (7.1 to 7.3)

Unit V: Chapter 7: Sections (7.4 to 7.8)

Reference Books :-

1. Krishnamurthy V, Arora J.L, *Linear Algebra* Affilicated East- west Press PVT. LTD. 1976.

2. Schaum's Outlines by *Linear Algebra* TATA Mcgraw-Hill Edition, 2012.

3. Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence By *Linear Algebra* Prentice – Hall of India Private Limited, 2004.

Annexure - 5

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DEPARTMENT OF MATHEMATICS
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(w.e.f. 2021- 2022 Batch onwards)

Title of the paper : Fuzzy Sets
Semester : V **Contact Hours :4**
Sub Code : 21ME5B **Credits :4**

Objective :

1.To Know the basic ideas of fuzzy sets.

2.To learn about operations and relations.

Unit :I

Crisp sets and Fuzzy sets -Introduction - Crisp sets - The notion of fuzzy sets-Basic concepts of fuzzy sets- classical logic- fuzzy logic

Unit : II

Operations on Fuzzy Sets -General discussion -fuzzy complement- fuzzy union - fuzzy intersection - combinations of operations - general aggregation operations.

Unit :III

Fuzzy relations - Crisp and fuzzy relations - binary relations - binary relations on a single set - equivalence and similarity relations.

Unit :IV

Compatibility or tolerance relations - Orderings.

Unit : V

Morphisms - Fuzzy relation equations.

Annexure - 5

Chapters:

Unit I: Chapter 1: Sections (1.1 to 1.6)
Unit II: Chapter 2: Sections (2.1 to 2.6)
Unit III: Chapter 3: Sections (3.1 to 3.4)
Unit IV: Chapter 3: Sections (3.5 and 3.6)
Unit V: Chapter 3: Sections (3.7 and 3.8)

Text Book: –

George J.Klir and T.A. Folger, *Fuzzy Sets , Uncertainty and Information,*

Prentice Hall of India (2012)

Reference Books:-

1. Dr. Bhargava A.K., *Fuzzy Set Theory Fuzzy Logic and Their Applications*, S.Chand & Company Pvt. Ltd.(2013)

2. George J.Klir and Bo Yuan, Fuzzy sets Fuzzy Logic, Theory and Applications, Prentice Hall of India (2002).

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DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS
(w.e.f. 2021- 2022 Batch onwards)

Title of the paper : Programming in C

Semester : V **Contact: 4 hours**

Sub Code : 21AA51 **Credits: 4**

Objectives:

1. To improve logical thinking and better understanding of programming techniques.
2. To help the students to solve large and complex problem .

Unit – I

Overview of C – Constants, Variables and Data Types.

Unit – II

Operators and Expressions- Decision Making and Branching

Unit – III

Arrays- Character Arrays and Strings.

Unit – IV

User-defined Functions

Unit – V

Structures and Unions-Pointers

Annexure - 5

Text Book: -

E.Balagurusamy, Programming in Ansi C, 5th Edition, Tata Mc Graw-Hill Publishing Company Limited(2011)

Chapters :

Unit – I: Chapter 1:1.1 to 1.12 & Chapter 2:2.1 to 2.14

Unit – II: Chapter 3: 3.1 to 3.1 & Chapter 5:5.1 to 5.9

Unit – III: Chapter 7:7.1 to 7.9 & Chapter 8:8.1 to 8.10

Unit – IV: Chapter 9: 9.1 to 9.19

Unit – V: Chapter 10: 10.1 to 10.14 & Chapter 11: 11.1 to 11.17

Reference Books: -

1. Ananthi Sheshasaayee , Sheshasaayee G., Programming Language C with Practicals , Second Edition, Margham Publications(2005).
2. Byron S Gottfried , Programming with C, 2nd Edition , Tata Mc Graw-Hill Publishing Company Limited(2006).
3. Ramaswamy S and Radha Ganesan P , Programming in C, 1st Edition , SCITECH Publications (INDIA) PVT.,LTD.(2005).

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DEPARTMENT OF MATHEMATICS

B.Sc MATHEMATICS

(w.e.f. 2021- 2022 Batch onwards)

Title of the paper	**: Programming in C (Practical)**	
Semester	**: V**	**Contact: 2 hours**
Sub Code	**: 21AA5P**	**Credit : 1**

Objectives:

To gain practical knowledge of C Language by writing and executing basic programs.

List of Programs:-

1. Write a program to calculate simple interest Compound interest.
2. Write a program to find the greatest number among 3 numbers.
3. Write a program to calculate the salesman commission

Amount of sales:	10,000	15,000	More than 15,000
Commission	: 5%	8%	10%

4. Write a Program to check a given number is Armstrong.
5. Write a program to reverse a given digit (atleast 5 digit number)
6. Write a program to reverse the given string-checking Palindrome
7. Write a program to find the sum of the digits.
8. Write a program to find the n_{c_r} values using functions.

9. Write a program to sort the numbers in Ascending order(Descending order)

10. Write a program to add the given two matrices(for three dimensional array)

11. Write a program to maintain the employee details using structure.

12. Write a program using pointers.

Annexure - 5

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DEPARTMENT OF MATHEMATICS

B.Sc MATHEMATICS

(w.e.f. 2021- 2022 Batch onwards)

Title of the paper : Complex Analysis

Semester : VI **Contact Hours :6**

Sub code : 21M61 **Credit :5**

Objective:

1. To visualize the algebraic structure of Complex number system.
2. To develop problem solving skills in Complex Integration.

UNIT I

Analytic functions: Functions of a complex variable – Limits – Theorems on limit – Continuous functions – Differentiability – The Cauchy Riemann equations - Analytic Functions – Harmonic functions.

UNIT II

Bilinear transformations: Elementary transformations – Bilinear transformations – Cross ratio – Fixed points of bilinear transformations – Some special bilinear transformations.

UNIT III

Complex Integration: Definite integral – Cauchy's theorem – Cauchy's integral formula – Higher derivatives.

UNIT IV

Series expansions – Taylor's series – Laurent's series – Zeros of an analytic function – Singularities.

UNIT V

Calculus of residues: Residues – Cauchy's Residue theorem – Evaluation of definite integrals (Type I only)

Annexure - 5

Text Book:

Dr. S. Arumugam, Prof. A. Thangapandi Isaac and Dr. A. Somasundaram, Complex Analysis, SciTech Publication, India Private Ltd., January 2018.

Unit I: Chapter 2 : Section (2.1 to 2.8)

Unit II: Chapter 3

Unit III: Chapter 6

Unit IV: Chapter 7

Unit V: Chapter 8 – Sections(8.1,8.2,8.3 (Type I only))

Reference Books:

1. P. Durai Pandian and Others, Complex Analysis, S. Chand Publishing Company, 2014.

2. Dr. R. Roopkumar, Complex Analysis, Pearson Education India, 2014.

3. T. K. M. Pillai, Dr. S. P. Rajagopalan and Dr. R. Sattanathan, Complex Analysis, S. Vishwanathan Private Ltd., 2009.

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DEPARTMENT OF MATHEMATICS

B.Sc MATHEMATICS

(w.e.f. 2021 - 2022 Batch onwards)

Title of the paper : Statistics -II
Semester : VI **Contact Hours : 6**
Sub code : 21M62 **Credits : 5**

Objective :

1. To study the some special distribution like Binomial, poisson and normal distribution.
2. To study the Test of significance (Large samples, small samples).

Unit:I

Random Variables: Discrete Random Variables – Continuous Random Variables - Mathematical Expectations – Moment Generating Functions-Characteristic Function.

Unit :II

Some special distributions: Binomial Distributions – Poisson Distributions-Normal Distributions –Some More Continuous Distributions (Gamma distribution ,Chi Square distribution , Student's –t distribution, Snedecor's-F distribution and Fischer's, Z- distributions).

Unit : III

Test of significance (Large samples): Sampling – Sampling Distribution – Testing of Hypothesis – Procedure for Testing of Hypothesis for Large Sample.

Unit : IV

Test of Significance (Small samples): Test of significance based on t-distribution(t- test) – Test for significance based on F-test – Test for significance of an observed sample Correlation.

Annexure - 5

Unit : V

Test based on χ^2 - distribution: χ^2 –Test- χ^2 –Test to test the goodness of fit-Test for independence of Attributes. **Analysis of variance:** One criterion of classification- two criteria of classification.

Text Book:-

S. Arumugam & A. Thangapandi Isaac , *Statistics,* New Gamma Publications Pvt Ltd (July 2011).

Chapters:-

Unit I : Chapter 12 : Sections (12.1 to 12.6)

Unit II : Chapter 13 : Sections (13.1 to 13.4)

Unit III : Chapter 14 : Sections (14.1 to 14.5)

Unit IV : Chapter 15 : Sections (15.1 to 15.3)

Unit V : Chapter 16 : Sections (16.1 to 16.3)

Chapter 17 : Sections (17.1 to 17.2)

Reference Books: -

1. Dr. Gupta S.P., *Statistical methods*, Sultan Chand & Sons, Educational Publishers,New Delhi (2008).

2. Pillai R.S.N., Bagavathi V., *Statistics,* 7th Edition, S. Chand and Company LTD(2014).

3. Sankara Narayanan T., Joseph A.Mangaladoss, *Statistics and Its Applications* Presi and Presi Publications(1992).

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DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS
(w.e.f. 2021- 2022 Batch onwards)

Title of the paper : Numerical Methods
Semester : VI **Contact Hours :6**
Sub Code :21M63 **Credits : 5**

Objective :

1. To find numerical solution for Algebraic and Transcendental equations and Simultaneous equations.
2. To know about interpolation.

Unit : I

Algebraic and Transcendental Equations - Introduction - Iteration Method - Bisection Method – Regula Falsi method -- Newton- Raphson Method . **Simultaneous Equations** – Simultaneous Equations - Back substitution - Gauss Elimination Method – Gauss Jordan Elimination Method – Iterative methods (Gauss Jacobi Iteration Method)– Gauss- Seidal Iteration Method .

Unit : II

Finite Differences –Difference operators - Other Difference operators.

Unit : III

Interpolation - Newton's Interpolation Formula - Lagrange's Interpolation formula - Divided Differences - Newton's Divided differences formula – Inverse Interpolation.

Unit : IV

Numerical Differentiation and Integration – Derivatives using Newton's forward difference formula – Derivatives using Newton's backward difference formula - Derivatives using central difference formula – Maxima and minima of the interpolating polynomial – Numerical integration – Newton-Cote's quadrature formula - Trapezoidal rule - Simpson's one third rule - Simpson's three eight rule.

Annexure - 5

Unit : V Numerical Solutions of Ordinary Differential Equations – Taylor's Series Method – Picard's Method - Euler's Method – Runge-Kutta Methods **.**

Text Book: -

S. Arumugam, A.Thangapandi Isaac and A.Somasundaram. Numerical Methods , Second Edition, Scitech Publications (India) Pvt. Ltd(2015).

Chapters:-

Unit I : Chapter 3 : Sections (3.2 to 3.5)
Chapter 4 : Sections (4.1 to 4.4 & 4.7, 4.8)

Unit II : Chapter 6 : Sections (6.1 & 6.2)

Unit III : Chapter 7 : Sections (7.1 & 7.3 to 7.6)

Unit IV : Chapter 8 : Sections (8.1 to 8.5)

Unit V : Chapter10: Sections (10.1 to 10.4)

Reference Books: -

1. Kandasamy.P.,Thilagavathy.K,K.Gunavathy *Numerical Methods,* Second Edition, Sultan Chand & Company Ltd,2003.

2. Sastry. S.S. *Introductory methods of Numerical Analysis.*Prentice Hall of Pvt., Ltd.,1988.

3. Venkataraman. M.K., *Numerical methods in Science and Engineering* National Publishing Company,2000.

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DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS
(w.e.f 2021-2022 Batch onwards)

Title of the paper : Object Oriented Programming with C++ **Contact Hours : 4**
Semester : VI **Credits : 4**
Sub. Code : 21AA61

Objective:

- To understand the concept of object oriented programming
- To develop programming skills .

Course Content:

Unit I :

Principles of OOP : Introduction to OOP Concepts – Tokens – Keywords – Identifiers – Constants – Expressions – If statement – switch statement – do , while statements.

Unit II :

Functions in C++ :M ain function - function prototyping – Call by reference – Return by reference – inline function – default argument- Constant argument - Reucrsion - Function Overloading – Friend and virtual Function – Math Library function

Unit III :

Classes, Objects, Constructor and Destructor : Define a class – Member functions - Making an outside function inline – nesting of member function – private member functions – Arrays within a class - memory allocation for objects – Static data members – Static member function – Array of objects –Objects as function arguments – Friendly function – Constructor - Parametrized constructor – Constructor with default argument – Destructo

Unit IV :

Operator Overloading and Inheritance

Operator Overloading – Overloading Unary and Binary operators - Overloading binary operators using friend function – Rules for Overloading operators – Inheritance defining derived classes- Single inheritance – making a private member inheritable – multilevel inheritance - multiple inheritance – abstract classes.

Unit V :

Pointers, Virtual functions and files

Pointers – Pointers to objects – this pointer – pointers to derived classes – Virtual functions – Files – Classes for file stream operations – Opening and closing a file.

Text Book:

E. Balagurusamy, *Object Oriented Programming with C++*, 4th Edition, Tata McGraw Hill Publishing Company Limited (2004).

Chapters:

Unit I : Chapter 1 : Sections(1.5 to 1.8)

Chapter 3: Sections(3.1 to 3.7, 3.13, 3.14, 3.17, 3.20 to 3.24)

Unit II : Chapter 4 : Sections (4.2 to 4.11)

Unit III: Chapter 5: Sections(5.3 to 5.15)

Chapter 6: Sections(6.2, 6.3, 6.5, 6.11)

Unit IV: Chapter 7 : Sections(7.2 to 7.5, 7.8)

Chapter 8: Sections (8.2 to 8.6, 8.10)

Unit V : Chapter 9: Sections (9.1 to 9.6)

Chapter 11: Sections(11.1 to 11.3)

Annexure - 5

Referece Books:

1. Herebert Schildt, *The Complete Reference C++*, 4th edition, Tata McGraw Hill Publishing Company Limited.

2. Radha Ganesan P., *Programming with C++*, SCITECH Publications (INDIA) PVT., LTD(2022)

3. Ravichandran D., *Programming with C++*, Second Edition, Tata McGraw Hill Publishing Company Limited (200

Annexure - 5

E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI-14.

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Re-accredited 3rd Cycle) with Grade A+ and CGPA 3.51 by NAAC
CBCS

DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS
(w.e.f 2021-2022 Batch onwards)

Title of the paper : C++ Practicals **Contact Hours : 2**
Semester : VI **Credits : 1**
Sub. Code : 21AA6P

Objective:

To analyze logically and gain knowledge in writing and executing the C++ programs

List of Programs:

1. Write a program to convert the value of Fahrenheit into Celcius (viceversa)

2. Write a program to calculate the Standard Deviation

3. Write a program to display the numbers using for loop

```
1
2 2
3 3 3
```

4. Write a program to check whether the given number is a palindrome

5. Write a program to calculate the factorial of a given number using recursion function.

6. Write a program to find the largest value using nesting function

7. Write a program to find the sum and difference of two numbers using member function

8.Write a program to display the number using constructor and destructor.

Annexure - 5

9. Write a program to find student mark details using array within a class.

10. Write a program to display the employee details

11. Write a program to add the two complex numbers

12. Write a program using object as pointer for displaying students results.

Annexure - 5

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DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS
(w.e.f. 2021- 2022 Batch onwards)

Skill-Based Elective

Title of the paper : Vector Calculus
Semester : V **Contact Hours:2**
Sub code :21SEM51 **Credits : 2**

Objective:

To understand the concept of Vector differentiation and integration.

Unit-I

Differentiation of vectors-Gradient.

Unit– II

Divergence and Curl – Solved problems.

Unit – III

Directional derivative – Solenoidal - Irrotational vectors.

Unit – IV

Line integral –Surface integral (without problems)

Unit – V

Theorems of Green, Gauss and Stoke's theorem (withoutproof)Simple applications.

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Text Book: -

S. Arumugam and A . Thangapandi Isaac, *Calculus* Volume – II

(Chapter – III),New Gamma Publishing House, Palayamkottai (2003).

Chapters:-

Unit – I : Chapter 7: Sections (7.2 & 7.3)

Unit – II & III : Chapter 7: Section 7.4

Unit – IV : Chapter 8: Sections (8.1 & 8.2)

Unit – V : Chapter 8: Section 8.3

Reference Books :-

1. Arumugam.S and Thangapandi Isaac,*Analytical Geometry 3D & Vector Calculus*, New Gamma Publishing House, Palayamkottai (2011).
2. Gupta .R,*Vector calculus***,**Laxmi publications New Delhi

Annexure - 5

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DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS
(w.e.f. 2021- 2022 Batch onwards)

Skill-Based Elective

Title of the paper : Quantitative Aptitude
Semester : V **Contact Hours :2**
Sub code :21SEM52 **Credits :2**

Objective:

To get familiar with short cut techniques to solve Mathematical problems.

Unit :I

Problems on Numbers & Problems on Ages

Unit :II

Profit and Loss-Ratio and Proportion

Unit:III

Time and Work-Time and Distance

Unit:IV

Averages - Probability

Unit:V

Permutations and Combinations – Heights & Distance

Annexure - 5

Text Book :

R.S. Aggarwal, *Quantitative Aptitude for Competitive Examinations*,

Sultan Chand & Sons Company ,(2007).

Chapters:-

Unit-I : Chapter 7 & Chapter 8

Unit-II : Chapter 11 & Chapter 12

Unit-III : Chapter 15 & Chapter 17

Unit-IV: Chapter 6 & Chapter 31

Unit-V : Chapter 30 & Chapter 34

Reference Books:-

1. Abhijit Guha, *Quantitative Aptitude* , Tata McGraw Hill Publishing Company(2011)
2. Dinesh Knaltar, *Quantitative Aptitude*, Dorling Kindersley(India) Pvt Ltd.,(2008).

Annexure - 5

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DEPARTMENT OF MATHEMATICS

B.Sc MATHEMATICS

(w.e.f. 2021- 2022 Batch onwards)

Skill-Based Elective

Title of the paper :Discrete Mathematics
Semester : VI Contact Hours : 2
Sub code : 21SEM61 Credits :2

Objective:

To provide the basic knowledge in logic and propositional

Calculus.

Unit – I

Introduction- TF statements - Connectives

Unit – II

Atomic and compound statements-Well formed (statement) formulae - Truth table of a formula -Tautology– Tautological Implication and equivalence of formulae

Unit - III

Lattices-Some Properties of Lattices-New Lattices

Unit - IV

Modular and Distributive Lattices - Boolean Algebra

Unit – V

Recurrence –an introduction –Recurrence Relation – Worked Examples.

Text Book: -

Dr. M.K. Venkatraman, Dr. N. Sridharan & Mr. N. Chandra sekaran
Discrete Mathematics , The National Publishing Company (2009).

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Chapter:-

Unit-I : Chapter 9: Sections (9.1 to 9.3)

Unit-II : Chapter 9: Sections (9.4 to 9.8)

Unit-III: Chapter 10: Sections (10.1 to 10.3)

Unit-IV: Chapter 10: Sections (10.4 to 10.5)

Unit-V: Chapter 5: Sections (5.1 to 5.3)

Reference Books: -

1. Ramaswamy V., *Discrete Mathematical Structures with Applications to Combinatorics,* Universities Press(India) Private Limited (2006).
2. Somasundaram R.M, *Discrete Mathematical Structures,* PHI Learning Private Limited, New Delhi(2009)

Annexure - 5

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DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS

(w.e.f. 2021- 2022 Batch onwards)
Skill-Based Elective

Title of the paper : Combinatorics
Semester : VI **Contact Hours :2**
Sub code : 21SEM62 **Credits :2**

Objective :

To introduce Combinatorial techniques for solving enumeration problems

Unit-I

The Rules of Sum and Product

Unit- II

Permutations - Combinations - Permutations and Combinations with Repetitions

Unit –III

The Binomial Theorem - Pascal's Identity - Vander Monde's Identity

Unit –IV

The Multinomial Theorem - Ramsey Number

Unit – V

The Catalan Numbers - Stirling Numbers and Bell Numbers.

Text Book :-

C. Vasudev, *Theory and Problems of Combinatorics*

New Age International Publishers (2008)

Annexure - 5

Chapters:-

Unit I: Chapter 1: Section 1.1

Unit II: Chapter 1: Sections (1.2 to 1.4)

Unit III: Chapter 1: Section 1.5

Unit IV: Chapter 1: Sections (1.5 to 1.6)

Unit V: Chapter 1: Sections (1.7 to 1.8)

Reference Books:-

1.APTE D.P *Probability And Combinatorics,*Excel Books(2007)

2. David A.Santos,*Probability An Introduction* (Chapter-2) Jones and Bartlett India Pvt.Ltd First Indian Edition(2011)