St.Mary's College(Autonomous)
Thoothukudi

Re-Accredited with A Grade by NAAC

SYLLABUS

2015- 18

B.Sc. Mathematics

Course Structure – B.Sc. Mathematics

Sem	Part	Component	Sub. Code :	Title of the paper	Hrs/Week	Credit
I	I	Tamil / French	15ULTA11/ 15ULFR11		6	3
	II	English	15UGEA11 15UGEB11 15UGEC11		6	3
	III	Core I Core II Allied I	15UMAC11 15UMAC12 15UPHA11	Algebra Calculus Allied Physics – Paper I Allied Practicals	5 5 4 2	5 5 4
	IV	Foundation course	15UFPD11	Personality Development	2	2
				Total	30	22
II	I	Tamil / French	15ULTA21/ 15ULFR21		6	3
	II	English	15UGEA21 15UGEB21 15UGEC21		6	3
	III	Core III Core IV	15UMAC21 15UMAC22	Analytical Geometry of three dimensions Differential Equations	5 5	5 5
		Allied II Practical I	15UPHA21 15UPHAR1	Allied Physics – Paper II Allied Practical	6	4 2
	IV	Foundation course	15UFVE21	Value Education	2	2
	V	NSS/NCC SPORTS				1
				Total	30	25
III	I	Tamil/ French	15ULTA31/ 15ULFR31		6	3
	II	English	15UGEA31 15UGEB31 15UGEC31		6	3
	III	Core V Allied III	15UMAC31 15UMAA31	Sequences and Series Statistics I	6 6	5 5

	IV	Skill Based Non - major Elective	15UMAS31	Mathematics for Competitive Exam / MATLAB	2 2	2 2
		Foundation course	15UFES31	EVS	2	2
				Total	30	22
IV	I	Tamil/ French	15ULTA41/ 15ULFR41		6	3
	II	English	15UGEA41 15UGEB41 15UGEC41		6	3
	III	Core VI	15UMAC41	Abstract Algebra	6	5
		Allied IV	15UMAA41	Statistics II	6	5
	IV	Skill Based Non - major Elective	15UMAS41	Office Automation	2 2	2 2
		Foundation course	15UFYM41	Yoga & Stress Management	2	2
		Extension activity				1
				Total	30	23
V	III	Core VII	15UMAC51	Linear Algebra	7	5
	III	Core VIII	15UMAC52	Real Analysis	7	5
	III	Core Elective I	15UMACE51	Statics	6	5
	III	Core Elective II	15UMACE52	Operations Research	6	5
	IV	Skill based	15UMAS51	Numerical Analysis With Programming in C	4	4

		Self Study compulsory Self study papers	15UMASS1 15UMASS2 15UMASS3	Astronomy Foundation of Mathematics Statistics		1 1 1
				Total	30	27
VI	III III III III	Core IX Core X Core XI Core XII	15UMAC61 15UMAC62 15UMAC63 15UMAC64	Complex Analysis Graph Theory Dynamics Vector Calculus and Trigonometry	6 6 6 6	5 5 5 5
	IV	Core Elective III/ Project	15UMAE61/ 15UMAP61	Project	6	5
				Total	30	25

Semester - I			
Part III Core I - Algebra			
Code :15UMAC11	**Hrs/week :5**	**Hrs/Sem :75**	**Credits :5**

Objectives

1. To introduce basics in Mathematics
2. To enable the students to solve polynomial equations & simultaneous linear equations.

Unit I

Fundamental theorem of algebra in theory of equations - relations between roots and coefficients of algebraic equations - symmetric functions of roots in terms of the co - efficients.

§Chapter 5 5.1(from Theorem3), 5.2 (Page 5.06 - 5.31)

Unit II

Sum of r^{th} power of the roots - Newton's theorem - Descartes' rule of signs - Roll's theorem. §Chapter 55.3 (5.32 – 5.42) &5.7 (5.74 - 5.81).

Unit III

Reciprocal equations - Transformation of equations.

§Chapter 55.4 &5.5 (Page 5.42 – 5.66)

Unit IV

Cardon's method for solution of cubic equations - Ferrari method for bi - quadratic equations. §Chapter 5 (page 5.90 – 5.103)

Unit V

Approximate solution of equations using Newton Raphson's method - Horner's method. §Chapter 55.10 (5.103 - 5.115)

Text Book

Arumugam S. and Issac, Algebra, New Gamma Publishing House, August 2006.

Reference Book

ManicavachagomPillay T.K., Natarajan T., GanapathyK.S **Algebra**

Volume - I, S.Viswanathan (Printers & Publishers), PVT., LTD., 2008

Semester - I			
Part III Core II - Calculus			
Code :15UMAC12	**Hrs/week :5**	**Hrs/Sem :75**	**Credits :5**

Objectives

1. To enable the students to master the concepts of differentiation and integration
2. To enhance the application skills on differentiation and integration

Unit I

Curvature and radius of curvature – Cartesian and polar co - ordination - Centre of curvature - Evolutes

(Text Book1Vol I Chapter X §Sec 2.1 - 2.4)

Unit II

Differentiation : Higher derivatives – n^{th} derivatives and Leibnitz theorem

(Text Book 2 Part I Chapter 2 , Sec 2.11 & 2.12)

Unit III

Evaluation of integrals : Revision of Different Methods of Integration Integration by Parts – Reduction Formulae

(Text Book 2 Part II Chapter 2, Sec 2.7 & 2.8)

Unit IV

Beta and Gamma functions.

(Text Book 2 Part II Chapter 4)

Unit V

Fourier series - Half - range, sine & cosine series.

(Text Book 2 Part II Chapter 5)

Text Books

1. Manichavasagam pillai T.K.&Narayanan, **Calculus Vol I &Vol II,**S.Viswanathan (Printers & Publishers) PVT. LTD.
2. ArumugamS. and Issac, **Calculus.**

Reference Books

1. Balachandra rao S., Shantha C.K., **Differential Calculus**, Wiley Eastern Limited
2. Shanti Narayanan, **Integral Calculus**, S.Chand& Company Ltd, New Delhi, 1991.

Semester - I			
Part III Allied Physics – Paper I			
Code :15UPHA11	**Hrs/week :4**	**Hrs/Sem :60**	**Credits :4**

Objectives:

To study about elasticity and bending moment
To know about surface tension and viscosity and to study Bernoulli's theorem
To study mean free path and transport phenomena
To determine thermal conductivity of the bad conductor and specific heat capacity of liquid
To have a knowledge about physical optics

Unit I: Elasticity

Elastic moduli – Work done in shearing strain – Relation between elastic constants – Twisting couple on a cylindrical wire – Expression for couple per unit twist – Torsion pendulum – Experiment to determine the rigidity modulus of a wire using Torsion pendulum.

Unit II:Bending moment

Bending of beams – Expression for bending moment - Theory of uniform bending – Expression for elevation in uniform bending – Experiment to find young's modulus using microscope – Non- uniform bending – Expression for depression – Experiment to find young's modulus using scale and telescope.

Unit III: Surface tension & Viscosity

Surface tension – Excess of pressure over a curved surface –Coefficient of viscosity and its dimension –Experiment to determine the coefficient of viscosity of a highly viscous liquid (Stoke's) – Rate of flow of liquid through a capillary tube by dimension method and by Poiseuille's method – Analogy between current flow and liquid flow.

Unit IV: Thermal Physics

Mean free path – expression for mean free path – Transport phenomena – Expression for viscosity , thermal conductivity and diffusion – Thermal conductivity - Lee's disc experiment to determine the thermal

conductivity of a bad conductor – Newton's law of cooling – Determination of specific heat capacity of a liquid.

Unit V: Interference and diffraction

Young's double slit experiment – Condition for interference – Additional phase difference due to dissimilar reflections – Colour of thin film – Air wedge –Thickness of a wire – Fresnel and Fraunhofer diffraction – Plane transmission grating - Experiment to find wavelength by normal incidence method – Distinction between interference and diffraction bands.

Text Books:

1. Allied Physics – A. Ubald Raj & G. Jose Robin

Books for reference:

1. A text book of Optics – Brijlal& Subramanian (S. Chand & Co)

2. Properties of matter – D. S. Mathur 1992 Shyamalal charitable trust, Ramnagar

3. Properties of matter – R. Murugeshan, Revised edition 2008, S. Chand & Co. Ltd.

4. Fundamentals of Physics - David Halliday &Roberresnik&Jeul Walker, John Wiley & sons Inc.

Semester - II			
Part III Core III - Analytical Geometry of three dimensions			
Code :15UMAC21	**Hrs/week :5**	**Hrs/Sem :75**	**Credits :5**

Objectives

1. To provide the basic knowledge in three dimensional geometry

2. To improve analytical skills

Unit I:

Direction cosines - direction ratios - angle between the lines – condition for perpendicularity and parallelism. **(Chapter 1, pages1 – 22)**

Unit II:

Equation of planes - normal form - intercept form - angle between two planes (**Chapter -2 Pages: 25-45)**

Unit III:

Straight line- symmetrical form - plane and the straight line- angle between two planes - image of a point - image of line.

(Chapter -2 Pages: 45-61)

Unit IV:

Skew lines - shortest distance between two lines - coplanar lines – volume of tetrahedron.

(Chapter 3 , pages61 - 91)

Unit V:

Sphere - plane section of sphere - tangent line - intersection of two spheres - intersection of a plane with sphere. **(Chapter- 4, pages: 92 - 114)**

Text Book

1. Manicavasagom pillay T.K.& Natarajan T., **Analytical Geometry of 3D**, S.Viswanathan (Printers & Publishers) Pvt.Ltd.

Reference Book:

Arumugam S. and others, **Analytical Geometry of Three Dimensions and Vector Calculus**, New Gamma Publishing House, January 2006.

Semester - II			
Part III Core IV - Differential Equations			
Code :15UMAC22	**Hrs/week :5**	**Hrs/Sem :75**	**Credits :5**

Objectives

1. To enable the students to solve various types of differential equations
2. To apply the concepts in various fields

Unit I

Linear differential equations of 2^{nd} order with constant coefficients – particular integral of the functions of the form e^{ax}, sinax, cosax, x^n,$e^{ax}f(x)$ &$x^nf(x)$. (Text Book 1 Chapter2 §Sections 2.1, 2.2 &2.3)

Unit II

First order higher degree equations - solvable for p, x & y, Clairaut's form (Text Book 1 Chapter1 §Section 1.7)

Unit III

Linear differential equation of 2^{nd} order with variable coefficients - homogeneous equations - equation reducible to homogeneous equation - method of variation of parameters.(Text Book 1 Chapter2 § Sections 2.4 &2.5)

Unit IV

Laplace transform - solving linear differential equation & simultaneous equations of first order using Laplace transforms. (Text Book 1 Chapter3)

Unit V

Partial differential equation – Lagrange'sform -first order formation - types of solutions - four standard forms – Charpit's method.

(Text Book 1 Chapter 4)

Text Books

1. Arumugam S.& others, Differential Equations and applications.

2.S.Arumugam & others, Analytical Geometry 3D &Vector Calculus.

Reference Book

Narayan S ManicavachagomPillay T.K.,**Differential Equations and its applications,**S.Viswanathan (Printers & Publishers), PVT., LTD., 2008

Semester - II			
Part III Allied Physics – Paper II			
Code :15UPHA21	**Hrs/week :4**	**Hrs/Sem :60**	**Credits :4**

Objectives:

To study about Coulomb's law & Gauss law and its applications
To determine self inductance using Ballistic Galvanometer
To derive Schrodinger's equation and to know uncertainty principle
To understand logic gates as universal building blocks
To study about solar energy and its applications

Unit I: Electrostatics

Coulomb's law – Electric field and field intensity – Electric field due to point charge – Electric dipole – Electric flux – Gauss law – Applications – Electric field due to a charged conducting sphere (point inside and point outside) – Uniformly charged cylinder (line charge) – Electric potential – Potential difference – Relation connecting electric field and electric potential at a point – Equipotential surface .

Unit II: Electromagnetism

Faraday's laws of induction – Induced current and charge – Self induction – Self inductance of torroidal solenoid - Determination of self inductance using Rayleigh method – Mutual inductance – Coefficient of coupling – Determination of mutual inductance using B.G.

Unit III: Relativity and Wave mechanics

Frame of reference – Galilean transformation – Postulates – Lorentz transformation –De Broglie's theory of matter waves – De Broglie wavelength – Wave function –Postulates of quantum mechanics – Schrodinger wave equation – Time dependent form.

Unit IV: Digital electronics

Binary numbers – Conversion of decimal number into binary number – Binary to decimal – Binary addition – Multiplication –Subtraction by 2's complement – Basic logic gates - OR , AND, NOT, NOR, NAND gates – De

Morgan's laws – Boolean equations and logic circuit from truth table – NOR and NAND gates as universal building blocks –Binary adder – Half adder.

Unit V: Energy Physics

World's reserve of commercial energy source and their availability – Various forms of energy – Conventional and non conventional energy sources – Solar energy – Photo voltaic effect – Photo voltaic cells – Conversion of solar energy into electricity – Solar cells – Solar heaters – Wind energy – Power of wind – Wind mill – Wind farms – Energy crisis and possible solutions – Global warming.

Text Books:

1. Allied Physics – A. Ubald Raj & G. Jose Robin

2. Modern Physics – R. Murugeshan

Book for reference:

1. Solar energy Utilization - G. D. Rai, Khanna Publishers, V edition, 7th reprint 2008.

2. Electricity & Magnetism – Brijlal N. Subramanian, Published by RatanPrakashanMandir, 14th revised edition, (1985).

3. Electricity and magnetism – K. K. Tewari, Published by Sultan chand& Co, Reprint-2nd edition-1994.

4. Integrated Electronics - Milman and Taub, International student edition, (TMH)

Semester – I & II			
Part III Allied Physics Practical			
Code :15UPHA11	**Hrs/week :2**	**Hrs/Sem :30**	**Credits :2**

Any 12 experiments

1. Young's modulus – Uniform bending – Pin and microscope
2. Young's modulus – Non-uniform bending – Scale and telescope
3. Rigidity modulus – Torsion pendulum
4. Specific heat capacity of liquid – Newton's law of cooling
5. A. C. frequency – Sonometer
6. Spectrometer – Dispersive power of the prism
7. Spectrometer – Grating – Oblique incidence
8. □ir wedge – Thickness of a wire
9. Potentiometer – Calibration of voltmeter by standardization method
10. Potentiometer – Calibration of Ammeter
11. Characteristics of Zener diode
12. Basic logic gates – OR, AND and NOT
13. Series resonance circuits
14. Parallel resonance circuits
15. Co-efficient of viscosity – Stoke's method
16. Surface tension – Capillary rise method.
17. Compound pendulum - g

Semester - III			
Part III Core V - Sequences and Series			
Code :15UMAC31	**Hrs/week :6**	**Hrs/Sem :90**	**Credits :5**

Objectives

1. To give an introductory knowledge of the basic abstract systems of Mathematics
2. To train the students to generalize the known concepts
3. To develop analytical thinking

Unit I

Inequalities – Introduction – Inequalities – Triangle inequalities – The arithmetic, Geometric and Harmonic Means – Cauchy Schwarz inequality – Some more inequalities. (Chapter 2)

Unit II

Sequences - Bounded Sequences - Monotonic Sequences - Convergent Sequences - Divergent and oscillating sequences - The algebra of limits- Behaviour of monotonic sequences (Chapter 3 §pages 39 - 68)

Unit III

Some theorems on limits – Subsequences - Limit points - Cauchy sequences -Cauchy's general principle of convergence of sequences (Chapter 3 §pages69 - 103)

Unit IV

Series - Infinite series - Comparison test - Kummer's test - D' Alembert's ratio test - Raabe's test - Gauss's test - Cauchy's Root test – Cauchy's condensation test(without proof) (Chapter 4 §pages 112 - 150)

Unit V

Alternating series –Leibnitz's test - Absolute convergence - Tests for convergence of series of arbitrary terms –Dirichlet's test –Abel's test - Multiplication of series - Abel's theorem – Merten's theorem (Chapter 5 §sec 5.1,5.2,5.3 &5.5)

Text Book

1. Dr. Arumugam, S. &ThangapandiIssac, A **Sequences and Series and Trigonometry**, New Gamma Publishing House, Palayamkottai (2006).

Reference Books

1. Joseph A. Mangaladoss ,**Sequences,Series and Trigonometry**.
2. Narayanan and Manicavachagom Pillay, **Trigonometry**, S.Viswanathan Printers & Publishers Pvt. Ltd.

Semester - III			
Part III Allied - Statistics I			
Code :15UMAA31	**Hrs/week :6**	**Hrs/Sem :90**	**Credits : 5**

Objectives

To help the students to understand the uses of statistics in various competitive fields.

Unit I

Moments - Skewness and kurtosis - Curve fitting - Method of least squares - fitting lines - parabolic, exponential & logarithmic curves

(Text book 1 Chapter 4,5)

Unit II

Correlation &regression - scatter diagram - Karl Pearson's coefficient of correlation - properties - lines of regression coefficient & properties - rank correlation (Text book 1 Chapter 6 §sections 6.1,6.2 6.3))

Unit III

Random variables, distribution function, two dimensional random variables, moment generating function, cumulants and characteristic function

(Text book 2 chapter5&7 §sections 5.2 to 5.5 and 7.1 to 7.3)

Unit IV

Discrete probability distribution - geometric, binomial & Poisson distribution & their moment generating functions, characteristic function, properties & simple application.(Text book 2 § Chapter8 §Section 8.4,8.5,8.7 (Omitting Negative Binomials))

Unit V

Continuous probability distributions - Beta1 , Beta2 &Gamma distributions, normal distributions - their properties - simple problems - importance of normal distribution (Text book 2§ Chapter 9 §sec 9.2, 9.5,9.6 and 9.7)

Text Books

1. S.Arumugam and A.Issac, **Statistics**, New Gamma publishing House. Palayamkottai

2. Gupta S.C., Kapoor V.K., **Fundamentals of mathematical Statistics** Eleventh edition, Sultan Chand & Sons, Educational Publishers, New Delhi

Reference books

1 H.C.Saxena, **Elementary Statistics,** S.Chand & Company Ltd., New Delhi

2. J.N.Kapurand Saxena, **Mathematical Statistics,** S.Chand & Company Ltd., New Delhi

Semester - III			
Part IV Skill Based Subject - Mathematics for Competitive Exam/ MATLAB			
Code :15UMAS41	**Hrs/week :2**	**Hrs/Sem :60**	**Credits :2**

OPTIONAL I Mathematics for Competitive Exam

Objectives

To train the students appearing for the competitive examinations

Unit I

Numbers – Square roots & cube roots(Chapter 1& 5)

Unit II

Time & Distance – Polygons(Chapter 17 & 25)

Unit III

Problems on Numbers – Problems on Ages(Chapter 7 & 8)

Unit IV

True Discount – Banker's Discount – Calendar (Chapter 26, 27 & 29)

Unit V

Series Test (Determination of wrong or missing term in the series) - BODMAS Rule.(Chapter 4)

Text Book

1. Agarwal R.S., **Arithmetic Subjective and Objective for Competitive Examinations (Revised Edition 2011)**, S.Chand and Company Ltd. , Ram Nagar, New Delhi - 55

2.Agarwal R.S., **Quantative Aptitude** , S.Chand and Company Ltd. , Ram Nagar, New Delhi - 55

OPTIONAL II MATLAB

Objectives:

To introduce and reinforce the use of problem solving methodology through the computers

Unit I:

Basic features –simple Math – The MATLAB workspace –About variables –Comments, Punctuations, and Aborting Execution –Complex Numbers –Floating –point Arithmetic –Mathematical functions -MATLAB windows –Managing the MATLAB workspace –Memory management – Number Display Formats –Keeping a Session Log –System Information –The MATLAB search path – Script M –File use –Block comments and Code Cells – Setting Execution Time –Startup and Finish – Simple Arrays –Array Addressing or Indexing –Array Construction –Array Orientation –Scalar – Array Mathematics

Unit II:

Multidimensional Arrays –Array Construction –Array Mathematics and Manipulation –Array Size –Numeric Data Types –Floating –Point Data Types – Summary –Cell Arrays and Structures –Cell Array creation – Cell Array Manipulation –Retrieving Cell Array Content –Comma –Separated Lists – Structure Functions – Summary – Character Strings – String Construction – Numbers to strings to Numbers – String Evaluation –String Functions – Cell Arrays of Strings –Searching with Regular Expressions – Relational and Logical operations –Relational operators –Logical operators –Operator Precedence –Relational and Logical Functions – NaNs and Empty Arrays.

Unit III :

Control Flow –For Loops – While Loops – If – Else –End Constructions –Switch –Case Constructions –Try –Catch Blocks –Functions –M-File Function Construction Rules – Input and output Arguments –Function Workspaces – Functions and the MATLAB search Path –File and Directory Management – Native Data Files –Data Import and Export –Low- level file I/O –Directory Management-FTP File Operations –Set, Bit, Base Functions – Set Functions – Bit Functions –Base Conversions –Time Computations – Current Date and Time –Date Format Conversions –Date functions –Timing Functions.

Unit IV:

Matrix Algebra – Sets of Linear Equations – Matrix Functions – Special Mattrices –Sparse Matrices – Sparse Matrix Functions –Data Analysis – Basic Statistical Analysis –Data Analysis and Statistical Functions –Data Interpolation –One Dimensional Interpolation –Two Dimensional Interpolation – Triangulation and Scattered Data – Summary-Polynomials –Roots – Multiplication –Addition –Division –Derivatives and Integrals –Evaluation – Rational Polynomials – Curve Fitting.

Unit V:

Integration and Differentiation –Integration – Differentation – Two Dimensional Graphics – The plot Function – Linestyles, Markers, and Colors – Plot Grids, Axes Box, and Labels –Customizing Plot Axes – Multiple Plots – Multiple Figures –Subplots – Interactive Plotting Tools-Text Formatting.

Text Book:

Mastering MATLAB 7 by Duane Hanselman Bruce Littlefield –Seventh impression

Reference Book:

Introduction to MATLAB 6 for Engineers by *William J. Palm III*McGRAW – Hill International edition

Semester – IV			
Part III Core VI - Abstract Algebra			
Code :15UMAC41	**Hrs/week :6**	**Hrs/Sem :90**	**Credits :5**

Objectives

1. To give an introductory knowledge of the basics abstract systems of mathematics
2. To train the students to generalize the known concepts
3. To develop analytical thinking.

Unit - I

Relations and Mappings :Relations - equivalence relations - Functions – Binary operations (Chapter 2§Sec 2.1 - 2.5)

Unit - II

Sub groups and Cyclic Groups: Permutation groups - sub groups - centre – normaliser Cyclic groups – properties order of an element cosets Lagrange's theorem - Euler's theorem - Fermat's theorem

(Chapter 3§Sec 3.4 - 3.8)

Unit – III

Normal Sub groups and Isomorphism Normal subgroups - properties – quotient group - isomorphism - Cayley's theorem homomorphism - automorphism fundamental theorems of homomorphism

(Chapter 3§Sec 3.9 - 3.11)

Unit - IV

Rings Rings - definition and examples - properties - ring homomorphism - different types of rings - characteristic of a ring - Sub rings (Chapter 4§Sec 4.1 - 4.6)

Unit - V

Subrings and Ideals Ideals - quotient rings - maximal and prime ideals – homomorphism of rings- Unique factorization domain – Euclidean domain (Chapter 4§Sec 4.7 - 4.10 and 4.13- 4.14)

Text Book

1. Arumugam S. and Thangapandi Isaac A - **Modern Algebra**,Scitech

Publications (India) PVT Ltd Chennai edition 2003

Reference Books

1. Bhattacharya P.B., Jain S.K., Nagpaul S.R., **Basic Abstract Algebra**, Second Edition, Cambridge University Press

2. Santiago M.L., **Modern Algebra**, Arul Publications, Madras, 1988

Semester – IV			
Part III Allied - Statistics II			
Code :15UMAA41	**Hrs/week :6**	**Hrs/Sem :90**	**Credits :5**

Objectives

1. To cater needs of statistics in professional and academic courses
2. To understand the application of statistics in various fields

Unit I

Characteristics of index numbers, Laspeyers and Paasche's – Bowley's - Marshall and Erdgeworth's index numbers - Tests - Unit test - Commodity reversal test, Time reversal test, Circular test. §Text book 2 chapter 9

Unit II

Statistical Quality Control - Definition, Advantages, Process control - Control chart, Mean chart, Range chart, P - chart, Product control - Sampling inspection plans. §Text book1 volume2 chapter 7 (A7.2, A7.4, 7.6, 7.7, 7.8, 7.15, 7.15, 7.19, 7.23)

Unit III

Testing of hypothesis - Null and Alternate Hypothesis. Type I and Type II errors - Critical region, level of significance - Test of significance for large samples - Testing a single proportion - Difference of proportions - testing a single mean - Difference of means. §Text book1 chapter 3 Sections 3.1 to 3.6

Unit IV

Tests based on t - distribution - Single mean - Difference of means - Tests based on F distribution - Variance ratio test - Test based on chi square distribution - Independence - Goodness of fit. §Text book1 chapter 3&4 (excluding the test for correlation)

Unit V

Analysis of Variance - One way and two way classified data - Basis of experimental design - simple problems. §Text book2 chapter17

Text Books

1. Gupta S.P., **Statistical Method** ,Sultan chand & sons publishers-New Delhi.
2. ArumugamS. and IssacA., **Statistics**, New Gamma publishing House. Palayamkottai.

Reference Book

1. Gupta S.C., Kapoor V.K., **Fundamentals of mathematical Statistics** , Eleventh edition, Sultan Chand & Sons, Educational Publishers, New Delhi

Semester – IV			
Part IV Skill Based Practical - Office Automation			
Code :15UMAS31	**Hrs/week :2**	**Hrs/Sem :60**	**Credits :2**

List of Practical for Office Automation

MSWORD 2000

1. Letter Writing (Formal) – Application for a job
2. Tables – Creating Time Table
3. Inserting Pictures(Clip Art, Smart Art, Word Art)
4. Inserting Shapes (Flow Charts)
5. Formatting a Page- colors, watermark etc .
6. Inserting Mathematical symbols and Formula
7. Inserting Charts

EXCEL 2000

8. Mark sheet Preparation
9. Payroll Preparation
10. Mathematical, Statistical
11. Logical Functions and Financial Functions
12. Graphs and Charts

MS POWERPOINT

13. Presentation I – National/ International Leader
14. Presentation II – Story/ incident
15. Presentation III- Subject (Maths)

Books for Reference

1. A. Leon, Introduction to computers

2.Alexis , Fundamentals of computing C Programming and MS Office, Vijay Nicole Pvt.Ltd.

3. Stephen L.Nelson,Office 2000The complete reference, Tata McGraw Hill Publishing Company Limited.

Semester –V			
Part III CoreVII - Linear Algebra			
Code :15UMAC51	**Hrs/week :7**	**Hrs/Sem :75**	**Credits :5**

Objectives

1. To extend the knowledge of concepts learnt in Abstract Algebra
2. To develop analytical thinking

Unit I

Vector spaces - Elementary properties - subspaces - Quotient spaces - Direct sum - Linear span of a set - Linear dependence and independence. (Chapter 5 §sec 5.1, 5.2, 5.4 &5.5)

Unit II

Basis - Dimension, Any two bases of a finite dimensional vector space have the same number of elements –Theorems on dimension.

(Chapter 5 §sec 5.3 &5.6)

Unit III

Linear transformations - vector space of linear transformations - Rank and nullity theorem – Matrix of linear transformations – Algebra of matrices - Types of matrices – The inverse of a matrix.

(Chapter 5 §sec 5.7 &5.8, Chapter 7 §sec 7.1, 7.2 &7.3)

Unit IV

Elementary transformations – Rank of a matrix - Characteristic equation of a matrix - Eigen values and eigen vectors - Cayley Hamilton theorem and problems – Solution of simultaneous equations using matrices. (Chapter 7 §sec 7.4, 7.5, 7.6, 7.7 &7.8)

Unit V

Inner product spaces – Norm – Schwartz inequality – Triangular inequality - Gram Schmidt orthogonolaisation process - orthogonal complement. (Chapter 6)

Text Book

1.Arumugam .S and ThangapandiIssac.A , **Modern Algebra** , Scitech Publications(India)Pvt.Ltd.Chennai.Edition2003

Reference Books

1. Bhattacharya P.B., Jain S.K., Nagpaul S.R., **Basic Abstract Algebra**, Second Edition, Cambridge University Press

2. Santiago M.L., **Modern Algebra**, Arul Publications, Madras, 1988

Semester –V			
Part III Core VIII - Real Analysis			
Code :15UMAC52	**Hrs/week :7**	**Hrs/Sem :90**	**Credits :5**

Objectives

1.To study the real number system and its properties

2.To study the properties of functions defined on the real line

Unit I

Metric spaces - Bounded sets - open ball - open sets - diameter of a set - interior of set

Unit II

Closed set - closure - limit point - dense sets - complete metric space - Cantor's intersection theorem - Baire's Category Theorem

Unit III

Continuity of functions - continuity of composition of functions - equivalent conditions for continuity - algebra of continuous functions - homeomorphism - uniform continuity - discontinuities

Unit IV

Connectedness - equivalent conditions - connected subsets of R - connectedness and continuity - continuous image of a connected set is connected - Intermediate mean value theorem

Unit V

Compactness - definition of open cover - compact metric space – Heine Borel theorem - compactness and continuity - continuous image of a compact set is compact - uniform continuity - Continuous function on a compact metric space is uniformly continuous – equivalent characterizations of compactness– compactness and continuity.

Text Book

1. ArumugamS. and Issac, **Modern Analysis**(Chapters 2,3,4,5 and 6).

Reference Book

1. Richard R Goldberg **Methods of Real Analysis,** Oxford & IBH Publishing Co, New Delhi

Semester –V			
Part III Core Elective I - Statics			
Code :15UMACE51	**Hrs/week :6**	**Hrs/Sem :75**	**Credits :5**

Objectives

To comprehend the application of statical theories in our day –today life

Unit I

Lami's theorem, Parallel forces and moments - Resultant of Two like and unlike parallel forces, moment of a force - Varignon's theorem - moment of force about an axis couples. (Text book1 chapter 3,4)

Unit II

Equilibrium of three forces acting on rigid body subjected to any three forces - three coplanar forces theorem, Two Trigonometrical theorems, problems. (Text book1 chapter5)

Unit III

Reduction of any number of coplanar theorems. Condition for a system of forces to reduce to a single force or a couple - General condition of equilibrium of a system of coplanar forces(Statement of theorems)problems. (Text book1 chapter6)

Unit IV

Frictions - Laws of friction - angle of friction - cone of friction - Equilibrium of particle on a rough inclined plane under a Force.
(Text book1 chapter7)

Unit V

Equilibrium of strings - equation the common catenary tension at any point - Geometrical properties of the common catenary - parabolic catenary uniforms chain under the action of gravity –suspension bridge.
(Text book1 chapter11)

Text Book

M.K.Venkatraman, **Statics,** Agasthiar Book House, Tiruchirapalli

Reference Book

Duraipandian P., **Mechanics**, S.Chand and Company Ltd

Semester –V			
Part III Core Elective II -Operations Research			
Code :15UMACE52	**Hrs/week :6**	**Hrs/Sem :75**	**Credits :5**

Objectives

1. To introduce the various techniques of operations research

2. To apply Mathematical theories to Commerce and Business and Management

Unit I

Introduction - Mathematical formulation of the problem - Graphical Solution method - General linear programming problem - Canonical and standard forms of L.P.P. - Simplex algorithm (No theorems)

Unit II

The big M method (Charnes Penalty Method) - Two phase simplex method - Duality - Dual Simplex method

Unit III

Transportation problem - Mathematical formulation - North West Corner Rule - Vogel's approximation method (Unit penalty method) - The method of matrix minima - optimality test - Maximization - u - v method.

Unit IV

Assignment problem - Mathematical formulation - Method of solution - Maximization of the effective matrix

Unit V

Sequencing problem - n - jobs and two machines - n - jobs and three machines, two jobs and m - machines

Text Book

GuptaP.K.,Kantiswarup and Manmohan,**Operations Research,**Sultan Chand & Sons, educational publishers, New Delhi -2

Books for Reference

1.Prem Kumar Gupta and Hira D.S., **Operations Research,**Sultan Chand & Sons, educational publishers, New Delhi -2

2.Billy E Gillet, **Introduction to Operations Research,** Tata McGraw Hill publishing Company, New Delhi

Semester –V			
Part IVSkill Based Subject-Numerical AnalysiswithProgramming in C			
Code :15UMAS51	**Hrs/week :4**	**Hrs/Sem :60**	**Credits :3**

Objectives

1. To enable students develop their calculation skills
2. To apply various techniques in solving numerical problems

Unit I

Difference operators - other difference operators - Newton interpolation - Lagrange's interpolation - Divided difference interpolation - inverse interpolation. **§**chapters 3 &4

Unit II

Numerical differentiation - Newton's forward and backward difference formula - Stirling's formula - maxima and minima of the interpolating polynomials. **§**chapter5

Unit III

Numerical integration - Newton's Cote's quadrature formula - trapezoidal rule - Simpson's one third rule - Simpson's three eight rule - Wedley's rule **§** chapter6

Unit IV

Numerical solution of differential equations - Taylor's series method - Picard's method - Euler's Method - Rungekutta method - Predictor and corrector formulae. **§** chapter7

Unit V

Programs in C – Newton's forward interpolation – Newton's Backward interpolation – Lagrange's interpolation –Newton's divided difference formula Derivatives using Newton's Forward difference formula – Newton's Backward difference formula –Trapezoidal Rule –Simpson's one –third Rule – Euler's method-Runge –Kutta method –Milne's method **§**Chapter 9(pg 25 – 40)

Text Book

S.Arumugam and Issac,**Numerical Analysis With Progrmming in C** New Gamma Publishing House, Palayamkottai

Semester –V			
Self Study Compulsory - Astronomy			
Code :15UMASS1	**Hrs/week :2**	**Hrs/Sem :30**	**Credits :2**

Objectives:

To introduce the exciting world of astronomy to the students.
To help the students to study about the celestial objects.

Unit I:

Solar System –The Sun - Mercury –Venus –Mars (Chapter XVI I sec 328 to 331)

Unit II:

Asteroids - Jupiter – Saturn – Uranus –Neptune -Pluto (chapter XVII sec 332 to sec 337)

Unit III:

Comets – Meteors – Zodiacal Light(chapter XVII sec 338 to 340)

Unit IV:

Stellar Universe –The Colour And Size Of Stars-Double And Multiple Stars –Variable Stars - Star Cluster – Milky Way(chapter XVIII sec 349 - 351,sec 353 ,sec 357))

Unit V:

The calendar –Lunar and solar calenders –Egyptian calendar –Mayen Calender –Roman calendar – Julian calendar -Gregorian calendar –world calendar –Indian National calendar –Tamil and Malayalam Calenders.(chapter XX sec 362 to 370)

Text Book

1. Kumaravelu S. & SusheelaKumaravelu, **Astronomy**, 8th Edition, Janaki Calendar Corporation, Sivakasi (1993)

Books for Reference

1. Ramachandran ,Text Book of Astronomy
2. SubramaniAiyar .H,Text book on Astronomy

Semester –VI			
Part III Core IX- Complex Analysis			
Code :15UMAC61	**Hrs/week :6**	**Hrs/Sem :90**	**Credits :5**

Objectives

1. To expose students to more complex theories of study
2. To sharpen analytical thinking and their problem solving capacity

Unit I

Complex Numbers – Circles and Straight lines – Extended Complex Plane - Analytic functions Continuous functions - Differentiability - Cauchy - Riemann equation.(Chapter 1&Chapter 2 §sec 2.4, 2.5, 2.6 & 2.7)

Unit II

Harmonic functions - Conformal mapping - Bilinear transformation - Cross ratio –Fixed points – Some special bilinear transformation. (Chapter 2 §sec 2.8 - 2.9 & Chapter 3)

Unit III

Complex integration Definite integral - Cauchy's theorem - Cauchy's integral formula - Higher derivatives (Chapter 6)

Unit IV

Series Expansions Taylor's series - Laurent's series - Zeros of Analytic Functions – Singularities (Chapter 7)

Unit V

Calculus of Residues Residues - Cauchy's Residue Theorem - Evaluation of Definite Integrals (Chapter 8)

Text Book

1. ArumugamS.,Thangapandi IssacA.,SomasundaramA.,**Complex Analysis**, SciTech publications(India) Pvt.Ltd.

ReferenceBooks

1. Narayanan,ManicavachagomPillai,**Complex Analysis,** S.Viswanathan printers & Publishers Pvt. Ltd.

2. P.Duraipandian ,Laxmi Duraipandian&D.Muhilan, **Complex Analysis,** Emerald Publishers, Chennai

3. Murray R. Spiegel, **Theory and problems of Complex Variables**

Semester –VI			
Part III Core X- Graph Theory			
Code :15UMAC62	**Hrs/week :6**	**Hrs/Sem :90**	**Credits :5**

Objectives

1. To translate situations to diagrammatic representations

2. To develop problem solving skills

Unit I

Graphs and sub graphs: Introduction - Definition and examples - Degrees - Sub graphs –Isomorphism - independent sets and coverings - intersection graphs - Line graphs - Matrices - Operation on graphs (Chapter 2 §Sections2.1,2.2,2.3,2.4,2.6,2.7,2.8&2.9)

Unit II

Degree Sequences: Introduction –Degree sequences - Graphic Sequence **Connectedness** - introduction - walks - trails and paths - Connectedness and components - blocks - connectivity. (Chapters 3& 4)

Unit III

Eulerian and Hamiltonian graphs: Introduction - Eulerian graphs - Hamiltonian graphs - **Trees –** introduction - Characterization of trees - Centre of a tree . (Chapters 5&6)

Unit IV

Planarity: Introduction - definition and properties - Characterization of planar graphs – thickness - crossing an outer planarity - Chromatic number and Chromatic index - the five colour theorem. (Chapter8, Chapter9 §Sections 9.1&9.2)

Unit V

Chromatic polynomials: Definition and basic properties of digraphs, paths and connectedness in digraphs, digraphs and matrices, tournaments. (Chapter 9 §Section 9.4, Chapter10)

Text Book

S. Arumugam , S. Ramachandran - **Invitation to Graph theory**, SCITECH publications (India) Pvt. Ltd., (2001) Chennai - 17.

Reference Book

Parthasarathy K.R., **Basic Graph Theory**, Tata McGraw Hill Publishing Company Limited, New Delhi

Semester –VI			
Part III Core XI- Dynamics			
Code :15UMAC63	**Hrs/week :6**	**Hrs/Sem :90**	**Credits :5**

Objectives

1. To provide a basic knowledge of the behaviour of objects in motion
2. To develop a working knowledge to handle practical problems

Unit I

Motion in a plane without air resistance –path of projectile - time of flight - horizontal range - motion of a projectile up an inclined plane.

(Text book1 chapter6)

Unit II

Fundamental laws of impact - impact of a smooth sphere on a fixed smooth plane - direct impact of smooth elastic spheres.(Text book chapter 8)

Unit III

Definition - Geometrical representation of S.H.M.'s –Composition of S.H.M.'s of the same period and in the same line - Composition of S.H.M.'s of the same period and in two perpendicular directions. (Text book chapter10)

Unit IV

Radial and transverse components of velocity and acceleration - Differential equation of a central orbit –given the orbit to find the law of force - given the law of force to find the orbit (Text book chapter11)

Unit V

Introduction of moment of inertia- (moment of inertia of certain cases)- Motion of the rigid body about a fixed axis - Kinetic energy - angular momentum - Equation of motion –conservation of angular momentum – principle of energy - Compound pendulum - Centers of suspension and oscillation. (Text book chapter13)

Text Book

1. VenkatramanM.K, **Dynamics,** Agasthiar Book house, Tiruchirapalli

Books for Reference

1.DharmapathamV., **Dynamics,** S.Viswanathan Printers and Publishers Pvt. Ltd

2. Duraipandiyan P, **Mechanics,** S.Chand Company, New Delhi

Semester –VI			
Part III Core XII-Vector Calculus and Trigonometry			
Code :15UMAC63	**Hrs/week :6**	**Hrs/Sem :90**	**Credits :5**

Objectives

To introduce physical application of derivatives of vectors.
To study the line integral, surface integral and volume integral and their applications.

Unit I

Vector differentiation –Differentiation of vectors – Gradient

(Chapter 5 Sec5.0,5.1,5.2,5.3)

Unit II

Divergence and Curl – Solenoidal, Irrotational

(Chapter 5 Sec5.4)

Unit III

Double and Triple Integrals – Jacobians –Change of variables in Double and Triple Integrals

(Chapter 6 Sec 6.0, 6.1, 6.2, 6.3, 6.4)

Unit IV

Vector integration - line integrals-Surface integrals - Gauss, Stokes and Green's theorems (Without proof), problems only

(Chapter 7)

Unit V

Hyperbolic functions - Logarithm of a complex number - Gregory's Series - Summation of trigonometric series using C+iS method

(Text Book 2 Chapter 7 pages 1 – 33)

Text Books

1. Arumugam S. and others, **Analytical Geometry of Three Dimensions and Vector Calculus**, New Gamma Publishing House, January 2011.

2. Sequences Series and Trigonometry

Semester –I			
Part III Allied Mathematics I for I B.Sc. Chemistry			
Code :15UMAA11	**Hrs/week :6**	**Hrs/Sem :90**	**Credits :5**

Objectives

1. To introduce basics in Mathematics
2. To familiarize the learners of Mathematics to Algebra and Calculus

Unit I

Theory of equations, relation between roots and co - efficient- Transformation of equations - Approximate solutions of equations - Horner's method and Newton's method

Unit II

Matrices Consistency and solution of equations - Characteristic equation of a matrix, Eigen values and Eigen vectors – Cayley - Hamilton theorem and simple problems

Unit III

Curvature and Radius of Curvature –Cartesian and polar co - ordination - Centre of Curvature - Evolutes

Unit IV

Vector Differentiation - Gradient - Curl - Divergence

Unit V

First order differential equations of higher degree - Equations solvable for p,x,y - Clairauts form - Linear equations of second and higher order with constant and variable co -efficients - particular integrals of the form x^n, $e^{ax}f(x)$

Text Book

S.Arumugam&Issac, Allied Mathematics, New Gamma Publishing House, Palayamkottai

Reference Books

1. Narayanan S., Kandaswamy P., Hanumantha Rao R., ManicavachagomPillay T.K., **Ancillary Mathematics Volume – I**, S.Viswanathan (Printers & Publishers), PVT., LTD., 2010

2. Narayanan S., Kandaswamy P., Hanumantha Rao R., Manicavachagom Pillay T.K., **Ancillary Mathematics Volume – II**, S.Viswanathan (Printers & Publishers), PVT., LTD., 2010

Semester –II			
Part III Allied Mathematics II for I B.Sc. Chemistry			
Code :15UMAA21	**Hrs/week :6**	**Hrs/Sem :90**	**Credits :5**

Objectives

1. To introduce the students to Differential Equations
2. To familiarize the learners of Mathematics to Integration and Vector Integration

Unit I

Partial differential equation –first order formation - types of solutions - four standard forms - Lagrange's form

Unit II

Laplace transforms - inverse Laplace transform - application to solution of differential equations (except simultaneous equations)

Unit III

Jacobian- Vector integration – line integral

Unit IV

Verification of Green's , Stoke's and Gauss Divergence theorems (simple problems only).

Unit V

Evaluation of integrals using Beta and Gamma functions

Text Book

S.Arumugam and Issac, Allied Mathematics,New Gamma Publishing House, Palayamkottai

Reference Books

1. Narayanan S., Kandaswamy P., Hanumantha Rao R., ManicavachagomPillay T.K., **Ancillary Mathematics Volume – I**, S.Viswanathan (Printers & Publishers), PVT., LTD., 2010
2. Narayanan S., Kandaswamy P., Hanumantha Rao R., ManicavachagomPillay T.K., **Ancillary Mathematics Volume – II**, S.Viswanathan (Printers & Publishers), PVT., LTD., 2010

Semester –III			
Part III Allied Mathematics-I for II B.Sc. Physics			
Code :15UMAA31	**Hrs/week :6**	**Hrs/Sem :90**	**Credits :5**

Objectives

1. To introduce basics in Mathematics
2. To familiarize the learners of Mathematics to Algebra and Calculus

Unit I

Theory of equations, relation between roots and co - efficient- Transformation of equations - Approximate solutions of equations - Horner's method and Newton's method

Unit II

Matrices Consistency and solution of equations - Characteristic equation of a matrix, Eigen values and Eigen vectors – Cayley - Hamilton theorem and simple problems

Unit III

Curvature and Radius of Curvature –Cartesian and polar co - ordination - Centre of Curvature - Evolutes

Unit IV

Vector Differentiation - Gradient - Curl - Divergence

Unit V

First order differential equations of higher degree - Equations solvable for p,x,y - Clairauts form - Linear equations of second and higher order with constant and variable co -efficients - particular integrals of the form x^n, $e^{ax}f(x)$

Text Book

S.Arumugam & Issac, Allied Mathematics, New Gamma Publishing House, Palayamkottai

Reference Books

1. Narayanan S., Kandaswamy P., Hanumantha Rao R., ManicavachagomPillay T.K., **Ancillary Mathematics Volume – I**, S.Viswanathan (Printers & Publishers), PVT., LTD., 2010

2. Narayanan S., Kandaswamy P., Hanumantha Rao R., ManicavachagomPillay T.K., **Ancillary Mathematics Volume – II**, S.Viswanathan (Printers & Publishers), PVT., LTD., 2010

Semester – III			
Part IV Non-Major Elective-Numerical Aptitude and Arithmetic Ability /Fundamentals of Mathematics			
Code :15UMAN31	**Hrs/week :2**	**Hrs/Sem :30**	**Credits :2**

OPTIONAL I : Numerical Aptitude and Arithmetic Ability

Objectives

1. To train the students appearing for the competitive examinations

2**.** To inculcate the skills in Arithmetic ability

Unit I

H.C.F and L.C.M of Numbers – Decimal Fractions (Chapters 2 &3)

Unit II

Simplification – Average (Chapters 4 & 6)

Unit III

Percentage – Profit and Loss (Chapters 10 & 11)

Unit IV

Ratio & Proportion –Time & work (Chapters 12 & 15)

Unit V

Time & Distance –Simple Interest (Chapters 17& 21)

Text Book

1. Agarwal R.S., Arithmetic Subjective and Objective for Competitive Examinations (Revised Edition 2011), S.Chand and Company Ltd. , Ram Nagar, New Delhi - 55

OPTIONAL II Fundamentals of Mathematics

Objectives

1. To receive deeper knowledge about trigonometrically results.

2. To acquire knowledge in Fourier series and Interpolation.

Unit I

Hyperbolic functions – Inverse Hyperbolic Functions.

Unit II

Logarithm of a Complex Number - Gregory's Series- Summation of trigonometric series C + iS Method

Unit III

Interpolation – E, Δ, ∇ Operators and Properties

Unit IV

Newton's and Lagrange's Formulae

Unit V

Fourier series, half range, sine and cosine Series

Text Book

1. Arumugam S. ThangapandiIssac, **Allied Mathematics,** New Gamma Publishing House, Palayamkottai

Semester – IV			
Part III Allied Mathematics-II for II B.Sc.Physics			
Code :15UMAA41	**Hrs/week :6**	**Hrs/Sem :90**	**Credits :5**

Objectives

1. To introduce the students to Differential Equations
2. To familiarize the learners of Mathematics to Integration and Vector Integration

Unit I

Partial differential equation –first order formation - types of solutions - four standard forms - Lagrange's form

Unit II

Laplace transforms - inverse Laplace transform - application to solution of differential equations (except simultaneous equations)

Unit III

Jacobian- Vector integration – line integral

Unit IV

Verification of Green's , Stoke's and Gauss Divergence theorems (simple problems only).

Unit V

Evaluation of integrals using Beta and Gamma functions

Text Book

S.Arumugam and Issac, Allied Mathematics,New Gamma Publishing House, Palayamkottai

Reference Books

1. Narayanan S., Kandaswamy P., Hanumantha Rao R., Manicavachagom Pillay T.K., **Ancillary Mathematics Volume – I**, S.Viswanathan (Printers & Publishers), PVT., LTD., 2010
2. Narayanan S., Kandaswamy P., Hanumantha Rao R., Manicavachagom Pillay T.K., **Ancillary Mathematics Volume – II**, S.Viswanathan (Printers & Publishers), PVT., LTD., 2010

Semester – IV			
Part IV Non Major Elective - Statistics			
Code :15UMAN41	**Hrs/week :2**	**Hrs/Sem :30**	**Credits :2**

Objectives

1. To introduce basics in statistics

2. To prepare the students to apply statistical skills in research

Unit I

Measures of central tendency - simple averages - mean, median, mode -Geometric mean and harmonic mean. **§**Chapter2

Unit II

Measures of dispersion – range - Quartile deviation - Mean deviation and standard deviation – co - efficient of variation. **§**Chapter 3

Unit III

Moments - skewness and kurtosis.**§**Chapter4

Unit IV

Curve fitting.**§**Chapter 5

UnitV

Correlation and regression. **§**Chapter6 sec 6.1, 6.2, 6.3

(only problems)

Text Book

Arumugam S. and Issac A., **Statistics**, New Gamma publishing House, Palayamkottai

Reference book

Sangaranarayan T. and others**, Statistics and its Applications**, Suja Publishing House, Palayamkottai.

Semester – V			
Self Study Optional – Foundations of Mathematics			
Code :15UMASS2	**Hrs/week :2**	**Hrs/Sem :30**	**Credits :2**

Objective

To introduce the Ancient and Modern History of Mathematics and Mathematicians

Unit – I

The Axiomatic method – Geometry according to Euclid – Euclid's postulates – Non Euclidean Geometry– Chapter 1 (page 1 – 19)

Unit – II

The formal axiomatic method - Description of formal axiomatic method –Analysis of axiomatic method – Consistency of axiomatic method - Completeness of an axiom system – Advantages and Disadvantages of the axiomatic method

Unit III

The Genetic method - The theory of sets – Equivalent sets – Cardinal numbers

Unit IV

Paradoxes in set theory –Cantor's Paradox – Russell's Paradox – Axiomatic set theory – The three schools of thought

Unit V

Truth tables method – The Predicate Calculus

Text Book:

A History of Mathematics, - K.S. Narayanan and K. Narasimhan, Taj printers, First Edition Reprint 1985

Reference Book:

The History of Ancient Indian Mathematics - C.N. SrinivasaIyengar, World Press Pvt. Ltd., Calcutta, 1967

Semester – V			
Self Study Optional – Statistics			
Code :15UMASS3	**Hrs/week :2**	**Hrs/Sem :30**	**Credits :2**

Unit I

Measures of dispersions: Measures of dispersions- Range – Quartile – Mean deviation – Standard deviation. **(Chapter: 3 , Sec:3.1)**

Unit II

Theory of Attributes: Theory of Attributes- Positive class frequencies – negative class - frequencies - Contrary frequencies.**(Chapter: 8 , Sec:8.1)**

Unit III

Consistancy of data: Consistancy of data- Consistent – InConsistent

(Chapter: 8 , Sec:8.2)

Unit IV

Independence and association of data: independence of two attributes

(Chapter :8 ,Sec 8.1)

Unit V

Coefficient of association – Yule's Coefficient.

Text Book:

Statistics by Dr.S. Arumugam and Mr.A. ThangapandiIssac.