PG & RESERACH DEPARTMENT OF MATHEMATICS
B.Sc. Mathematics Programme
SCHEME OF EXAMINATIONS (2014-2015 onwards)

Semester	Course Code	Course Title	L + T/ Hours per week	Duration Of Exam	Max. Marks			Credit Points
					CA	ESE	Total	
I	14UTL01	Part I - Tamil Paper - I	6	3	25	75	100	3
	14UEN01	Part II - English for Enrichment - I	5	3	25	75	100	3
	14UMSC01	Part III -Classical Algebra	5	3	25	75	100	4
	14UMSC02	Calculus	6	3	25	75	100	5
	14UMSA01	Mathematical Statistics I	6	3	25	75	100	5
	14HEC01	Part IV - Human Excellence	1	3	-	50	50	1
	14EVS01	Environmental Studies	1	-	-	-	-	-
II	14UTL02	Part I - Tamil Paper - II	6	3	25	75	100	3
	14UEN02	Part II - English for Enrichment - II	5	3	25	75	100	3
	14UMSC03	Part III - Analytical Geometry and Vector Calculus	5	3	25	75	100	4
	14UMSC04	Numerical Methods	5	3	25	75	100	4
	14UMSA02	Mathematical Statistics II	6	3	25	75	100	5
	14HEC02	Part IV - Human Excellence	1	3	-	50	50	1
	14EVS01	Environmental Studies	1	3	-	50	50	2
	14UHR01	SB – Human Rights	1	3		50	50	2
III	14UTL03	Part I - Tamil Paper – III	5	3	25	75	100	3
	14UEN03	Part II - English for Excellence - I	6	3	25	75	100	3
	14UMSC05	Part III - Dynamics	4	3	25	75	100	4
	14UMSC06	Operations Research -I	5	3	25	75	100	4
	14UMSA03	Physics for Mathematics and Chemistry – I	8	3	25	75	100	4
	14HEC03	Part IV – Human Excellence	1	3	-	50	50	1
	14UMSNA1	NME- Quantitative Aptitude -I	1	3	-	50	50	2
IV	14UTL04	Part I - Tamil Paper - IV	5	3	25	75	100	3
	14UEN04	Part II - English for Excellence - II	6	3	25	75	100	3
	14UMSC07	Part III - Statics	4	3	25	75	100	4
	14UMSC08	Operations Research -II	5	3	25	75	100	4
	14UMSA04	Physics for Mathematics and Chemistry - II	8	3	25	75	100	4
	14UMSA05	Physics lab for Mathematics and	-	3	40	60	100	2
	14HEC04	Part IV - Human Excellence	1	3	-	50	50	1
	14UMSNA2	NME- Quantitative Aptitude -II	1	3	-	50	50	2
		Part V - Extension Activities	-	-	-	-	50	1

	14UMSC09	Part III – Modern Algebra	6	3	25	75	100	4
	14UMSC10	Part III - Real Analysis – I	6	3	25	75	100	4
	14UMSC11	Part III - Complex Analysis - I	5	3	25	75	100	4
V	14UMSC12	Part III – Theory of Numbers	5	3	25	75	100	4
	14UMSC13	Part III - Programming in C / Elective	4	3	25	75	100/2=50	3
	14UMSC14	Part III - Programming Lab in C	2	3	40	60	100/2=50	2
	14HEC05	Part IV - Human Excellence	1	3	-	50	50	1
	14GKL01	SB - General Awareness (SS)	-	3	-	100	50	2
	14UMSSA1	SB- Mathematics For Finance I	1	3	-	50	50	2
	14UMSC15	Part III - Linear Algebra	6	3	25	75	100	4
	14UMSC16	Part III - Real Analysis - II	6	3	25	75	100	4
	14UMSC17	Part III - Complex Analysis - II	5	3	25	75	100	4
	14UMSC18	Part III – Discrete Mathematics / Elective	5	3	25	75	100	4
VI	14UMSC19	Part III - OOP With C++/ Elective	4	3	25	75	100/2=50	3
	14UMSC20	Part III - Programming Lab in OOP With C++	2	3	40	60	100/2=50	2
	14HEC06	Part IV - Human Excellence	1	3	-	50	50	1
	14UMSSA2	SB- Mathematics For Finance - II	1	3	-	50	50	2
							Total : 3800	140

SB- Skill Based, SS - Self Study, L-Lecture, T-Tutorial and P-Practical.
NME – Non Major Elective, SB NME - Skill Based Non Major Elective

General Question Pattern

Papers

Max Marks: 100	Internal : 25	External 75	
Section	Pattern	Mark	Total
Part A	Multiple choice (10 Questions)	10 * 1	10
Part B	Either (or) choice (5 Questions)	5 * 5	25
Part C	Either (or) choice (5 Questions)	5* 8	40
		Total :	75

Question Pattern for EVS & Skill Based (Elective)

Max Marks: 100		External : 50	
Section	Pattern	Mark	Total
Part A	Short answer/multiple choice (10 Questions)	$10 * 1$	10
Part B	Open choice (5 out of 8 Questions)	$5 * 8$	40
		Total :	50

List of Electives

1. Astronomy
2. Special Functions
3. Mathematical Modeling
4. Programming in C
5. Fuzzy Set Theory
6. Graph Theory
7. Mathematics in Finance
8. OOP with C++

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC01 **Title : CLASSICAL ALGEBRA**		
Hrs/ Week	5	**Credits :** 4
Objectives	This paper provides the learners a wide spectrum of basic mathematical concepts. This paper enables the learners to (i) develop skills in solving algebraic equation (ii) expand their knowledge in matrices.	
Unit	**Contents**	**Hrs**
Unit-I	Binomial theorem for rational index (Statement only) – Application of Binomial theorem to summation of series – Exponential theorem (Statement only) – Summation of series - The logarithmic series – Summation	13 hours
Unit-II	Theory of equations – Roots of an equation (Simple problems and Results only) – Relation between roots and coefficients – Symmetric functions of the roots of an equation.	13 hours
Unit-III	Newton's theorem on sum of the powers of the roots (Statements and problems only) – Transformation of equations – Reciprocal equations.	12 hours
Unit-IV	To increase or decrease the roots of a given equation by a given quantity – Removal of terms – Descartes rule of signs.	12 hours
Unit-V	Matrices – Special types of Matrices- Characteristic roots, Characteristic vectors- Diagonalization of a matrix.	12 hours
Text Books	1. Manicavachagam pillay, T.K., Natarajan, T. and Ganapathy, K.S. (1956, Reprint 1999). *Algebra Volume I*. First edition. S. Viswanathan Pvt. Ltd. 2. Kandasamy, P and Thilagavathi, K. (2004). *Mathematics for B. Sc.*	

	Branch – I, Volume II. First Edition.
Reference Books	1. Thakur, B.R., Sinha, H.C., Agarwal, B.L. and Johri, V. B. (1970). *A text book of Algebra*. Ram Prasad & sons. 2. Ray, M. and Sharma, H. S. (1988). *A text book of Higher Algebra*. S. Chand & Company.

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC02 **Title : CALCULUS**		
Hrs/ Week	6	**Credits :5**
Objectives	This paper enables the learners to (i) understand the concepts of multiple integrals, Beta and Gamma functions (ii) learn about various types of differential equations and methods to solve them (iii) gain basic knowledge of Laplace transforms.	
Unit	**Contents**	**Hrs**
Unit-I	Linear differential equations with constant coefficients – Special methods of finding particular integral – Linear equations with variable coefficients.	14 hours
Unit-II	Derivation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Different integrals of partial differential equations – Standard types of first order equations – Lagrange's equation.	16 hours
Unit-III	Multiple integrals–Definition of double integral – Evaluation of double integral – Double integral in polar co-ordinates – Triple integrals.	14 hours
Unit-IV	Change of variables – Jacobian – Transformation from Cartesian to polar co-ordinates– Transformation from Cartesian to spherical polar co-ordinates- Beta and Gamma functions – Applications of Gamma functions to multiple integrals.	16 hours
Unit-V	Laplace Transforms - Definition – Transform of f(t), e^{at}, cosat, sinat and t^n when n is an integer – Laplace transforms to solve ordinary differential equation with constant coefficients – Inverse Laplace transforms.	15 hours

Text Books	1. Narayanan, S. and Manicavachagom Pillay, T.K. (2007). *Calculus Volume – II*. S. Viswanathan Pvt. Ltd. [For Units III & IV]. 2. Narayanan, S. and Manicavachagom Pillay, T.K. (2007). *Calculus Volume–III.* S. Viswanathan Pvt. Ltd. [For Units I, II & V].
Reference Books	1. Dass, H.K. (2006). *Advanced Engineering Mathematics (Sixteenth Edition),* S.Chand and Company Ltd, New Delhi. 2. Kandasamy, P. and Thilagavathi, K.(2004). *Allied Mathematics (Paper-II),* ,S.Chand and Company Ltd, New Delhi. 3. Kandasamy, P. and Thilagavathi, K.(2009). *Mathematics (Volume-III),* S.Chand and Company Ltd, New Delhi.

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSA01 **Title : MATHEMATICAL STATISTICS – I**		
Hrs/ Week	6	**Credits : 5**
Objectives	On successful completion of the course the students should have understood the concepts of random variable, discrete, continuous probability functions, expectations, covariance, Moment generating functions, Cumulants, characteristic functions and some discrete and continuous distributions and should have developed skills to apply them to various real life situations.	

Unit	Contents	Hrs
Unit-I	[Review of Discrete and Continuous Random Variable, Probability mass and density function (No questions in this portion)] Mathematical Expectation - Properties - Addition and Multiplication Theorem-Simple problems. Definition of Covariance- Chebychev's inequality-Statement with Proof Simple problems.	15 hours
Unit-II	Moment Generating Function (MGF)- Definition-Properties (with proof) Cumulants - relation between Cumulant and central moment. Characteristic Function definition - properties with proof.	15 hours
Unit-III	MGF of Binomial distribution - finding mean and variance - Additive property -recurrence relation. MGF of Poisson distribution - finding mean and variance - Additive property -recurrence relation.	15 hours
Unit-IV	Normal distribution: Properties - uses - MGF of Normal distribution about its origin and about arithmetic mean - recurrence relation - additive property. Rectangular distribution- Definition - MGF - finding mean and variance - Simple problems.	15 hours

Unit-V	Gamma Distribution: MGF of Gamma distribution and finding the central moments - Additive property of Gamma varieties. Beta distributions of first and second kind: definition - finding mean and variance Exponential distribution: -definition - MGF- finding mean and variance.	15 hours
Text Book	Gupta, S.C. and Kapoor, V.K. (2006). *Fundamentals of Mathematical Statistics.* S. Chand & Sons.	
Reference Books	1. Vital, P.R. (2004). *Mathematical Statistics.* Margham publications. 2. Hogg, R.V. and Craigh, A.G. (2004). *Introduction to Mathematical Statistics.* Pearson Education publications.	

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UPS 01/ 14 UCY 01 **Title : ANCILLARY MATHEMATICS FOR PHYSICS AND CHEMISTRY-I**		
Hrs/ Week	8	**Credits : 5**
Objectives	One aim of this paper is to train the students and to import basic knowledge of mathematics relevant to their major subjects. This syllabus enables students to (i) Explore matrix theory (ii) Expand their in solving Algebric equations and learn (iii) Develop their knowledge in Fourier series, Beta and Gamma functions.	
Unit	**Contents**	**Hrs**
Unit-I	Symmetric and Skew-Symmetric matrices- Hermitian and Skew - Hermitian matrices-Orthogonal and unitary matrices - Characteristic Equation of a matrix- The Characteristic vectors of a matrix- Cayley-Hamilton's theorem(without proof)-Simple Problems.	17 hours
Unit-II	Fundamental theorem in the theory of Equations – Relation between the roots and co-efficients of an Equation - Imaginary and Irrational roots – Reciprocal Equation – Diminishing the roots of an Equation – Removal of term – Simple Problems.	17 hours
Unit-III	Exponential Series – Logarithmic Series – Binomial Series – Simple Problems.	16 hours
Unit-IV	Fourier Series – Simple Problems.	15 hours
Unit-V	Beta, Gamma Functions – Simple Problems.	15 hours
Text Book	Dr. Vittal, P. R. (2010). *Allied Mathematics*. Fourth Edition. Chennai: Margham Publications.	

Reference Books	1. Kandasamy, P. and Thilagavathi, K. (2003). *Allied Mathematics (Volume-I)*, S.Chand Company Ltd. 2. Kandasamy, P. and Thilagavathi, K. (2004). *Allied Mathematics (Volume-II)*, S.Chand Company Ltd.

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC03 **Title : ANALYTICAL GEOMETRY AND VECTOR CALCULUS**		
Hrs/ Week	5	**Credits : 4**
Objectives	This paper enables the students to (i) learn about the properties of circle, sphere and cone (ii) provide basic knowledge of vector calculus (iii) learn about applications of integration.	

Unit	**Contents**	**Hrs**
Unit-I	Polar co-ordinates – Relations between Polar and rectangular cartesian co-ordinates – Polar equations of Straight line, Circle, Chord of a circle, Conic and Chord of a Conic – Simple problems.	15 hours
Unit-II	Equation of a sphere – Standard equation of a sphere - Results based on properties of a sphere – Tangent Plane to Sphere – Equations of a Circle – Equation of a Cone – Cone with vertex is at the origin.	14 hours
Unit-III	Differentiation of vectors and Scalar point functions (Results only) – Gradient – Divergence and Curl – Formulae involving operator ∇ - operators involving ∇ twice - Simple problems.	14 hours
Unit-IV	Line integrals – Surface integrals – Volume integrals – Simple problems.	16hours
Unit-V	Gauss divergence theorem – Green's theorem (In space) - Stokes theorem – Green's theorem (In plane) – Applications.	16 hours

Text Books	1. Duraipandian, P., Laxmi Duraipandian and Muhilan, D. (1968, Reprint 1997). *Analytical geometry – 2 dimensional*. First Edition. (for Unit I). 2. Duraipandian, P., Laxmi Duraipandian and Muhilan, D. (1975, Reprint 2000). *Analytical geometry – 3 dimensional*. First Edition. (for Unit II). 3. Narayanan, S. and Manichavachagam Pillay, T. K. (1997). *Vector Calculus.* S. Viswanathan Pvt. Ltd.(for Unit III to Unit V).
Reference Books	1. Kar, B. K.(2008). *Advanced analytical geometry and vector analysis,* Books & Allied Pvt Ltd. 2. Shanthi Narayanan. (2005). *A text book of vector analysis.* S. Chand & company Ltd.

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC04 **Title : NUMERICAL METHODS**		
Hrs/ Week	5	**Credits : 4**
Objectives	To enable the students to learn and use numerical techniques to get numerical solutions to equations like transcendental and non linear differential equations when ordinary analytical methods fail.	
Unit	**Contents**	**Hrs**
Unit-I	The solution of Numerical Algebraic and Transcendental Equations: Introduction-The Bisection method-The iteration method-The method of false position (Regula Falsi Method) – Newton Raphson method.	13 hours
Unit-II	Interpolation: Introduction - Linear interpolation - Gregory Newton Forward and Backward interpolation Formula - Equidistant terms with one or more missing values.	13 hours
Unit-III	Numerical Differentiation: Introduction - Newton's forward difference formula to compute the derivatives - Newton's backward difference formula to compute the derivatives - Derivatives using Stirling's formula – remarks on numerical differentiation – maxima and minima of a tabulated function.	12 hours
Unit-IV	Numerical Integration: The Trapezoidal rule – Romberg's method - Simpson's one third - Practical applications of Simpson's rule.	12 hours
Unit-V	Numerical Solution of Ordinary Differential Equations: Euler's method – improved Euler's method - Modified Euler method – Runge Kutta method - Second order Runge Kutta Method – Higher order Runge Kutta methods.	12 hours
Text Book	Venkataraman, M.K. (2006). *Numerical Methods in Science and Engineering*. Madras: The National Publishing Company.	
Reference Book	Kandasamy, P. Thilagavathy, K. & Gunavathi. K. (Reprint 2012). *Numerical Methods,* S. Chand company Ltd.	

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSA02 **Title : MATHEMATICAL STATISTICS – II**		
Hrs/ Week	6	**Credits : 5**
Objectives	On successful completion of the course the students should have understood the concepts of Two Dimensional Random Variable, Moments of Bivariate Probability Distributions, Linear Regressions and developed skills to apply Sampling procedures to different situations.	
Unit	**Contents**	**Hrs**
Unit-I	Two-Dimensional Random Variables: Two-Dimensional or Joint Probability Mass Function - Two-Dimensional Distribution function - Marginal Distribution functions- Joint Density function, Marginal Density Function - The conditional Distribution Function and Conditional Probability Density function. Moments of Bivariate Probability Distributions - Conditional Expectation and Conditional Variance - Simple problems.	15 hours
Unit-II	Karl Pearson's coefficient of Correlation: Limits for Correlation Coefficient - Calculation of the Correlation Coefficient for a Bivariate Frequency Distribution. Rank Correlation: Spearmen's Rank Correlation Coefficient - problems only (no derivations). Linear Regression: Regression Coefficients - Properties of Regression Coefficients- Angle between two Lines of Regression - Simple Problems.	20 hours

Unit-III	Parameter and Statistic: Sampling Distribution of a Statistic - Standard Error. Tests of Significance: Null and alternative Hypothesis - Errors in sampling - Critical Region and Level of Significance - One-tailed and Two-tailed tests - Critical Values or Significant Values. Procedure for Testing of Hypothesis. Tests of Significance for Large Samples. Sampling of Attributes: Test of significance for (Simple Problems) 1. Single Proportion 2. Difference of Proportions Sampling of Variables: Test of significance for (Simple Problems) 1. Single Mean 2. Difference of Means	20 hours
Unit-IV	Applications of χ^2 Distribution: Inferences about a Population Variance - Goodness of Fit Test - Test of Independence of Attributes - 2x2 Contingency Table only - Simple Problems.	10 hours
Unit-V	Applications of t- Distribution: t-test for Single Mean - t-test for Difference of Means - t-test for Testing the Significance of an Observed Sample Correlation Coefficient. Applications of F-Distribution: F-test for Equality of Two Population Variances - Simple Problems.	10 hours
Text Book	Gupta, S.C. and Kapoor, V.K. (2009). *Fundamentals of Mathematical Statistics.* S. Chand & Sons.	
Reference Books	1. Vital, P.R. (2004). *Mathematical Statistics*. Margham publications. 2. Hogg, R.V. and Craigh, A.G. (2004). *Introduction to Mathematical Statistics*. Pearson Education publications.	

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UPS02 / 14 UCY02 **Title : ANCILLARY MATHEMATICS FOR PHYSICS AND CHEMISTRY-II**		
Hrs/ Week	8	**Credits : 5**
Objectives	On completion of the course the learness are expected to (i) have a good understanding, application ability of Hyperbolic functions and Laplace functions (ii) have a very good understanding of vector calculas	

Unit	**Contents**	**Hrs**
Unit-I	Hyperbolic functions, Relations between circular and Hyperbolic functions, Addition formulae for hyperbolic functions –Problems.	20 Hours
Unit-II	Laplace Transforms: Definition, Laplace transform of elementary functions, Linear property, Shifting property, Change of scale property, Laplace transforms of derivatives, Laplace transform of integrals, Multiplication by t -Problems.	21 Hours
Unit-III	Vector Differentiation: Gradient, Curl and Divergence - Problems..	19 Hours
Unit-IV	Line Integral – Surface Integral – Volume Integral – Problems.	21 Hours
Unit-V	Green's theorem (without proof) – Stoke's theorem (without proof) – Gauss's divergence theorem (without proof) – Problems.	19 Hours

Text Book	Dr. Vittal, P. R . (Reprint 2010). *Allied Mathematics.* Fourth Edition. Chennai: Margham Publications.
Reference Books	1. Kar, B. K.(2008). *Advanced analytical geometry and vector analysis,* Books & Allied Pvt Ltd. 2. Shanthi Narayanan. (2005). *A text book of vector analysis.* S. Chand & company Ltd.

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC 05 **Title : DYNAMICS**		
Hrs/ Week	4	**Credits : 4**
Objectives	To enable the students to apply laws, principles and postulates governing the dynamics in physical reality. At the end of this course, the student will be able to comprehend the notion of impulsive and coplanar forces, and will have a sound knowledge in rigid body motion and able to realize the reason for dynamic changes in the body.	
Unit	**Contents**	**Hrs**
Unit-I	Projectiles – Simple problems.	12 hours
Unit-II	Simple Harmonic Motion – Simple problems.	10 hours
Unit-III	Motion under the action of central forces – Simple problems.	12 hours
Unit-IV	Impulsive forces - Simple problems.	6 hours
Unit-V	Collision of elastic bodies – Simple problems.	10 hours
Text Book	Venkataraman, M. K. (2006). *Dynamics.* Twelfth Edition. Agasthiar publications.	
Reference Books	1. Dharmapadam, A. V. (1998). *Dynamics. Chennai:* S. Viswanathan Printers and Publishers Pvt. Ltd. 2. Viswanath Naik, K. and Kasi, M. S. (1992). *Dynamics*. Emerald publishers.	

Department	**Mathematics**	
Course	**B. Sc.**	**Effective From the Year : 2014**
Subject code : 14UMSC06 **Title : OPERATIONS RESEARCH - I**		
Hrs/ Week	5	Credits : 4
Objectives	The prime objective of this paper is to introduce certain OR techniques such as LPP, Transportation problems, Assignment problems, Sequencing and Replacing models to help the students to develop logical reasoning for applying mathematical tools to managerial and other life oriented problems.	
Units	Contents	Hrs
Unit-I	Linear Programming Problem: Introduction - Mathematical Formulation of the Problem - Graphical Solution Method - General Linear Programming Problem - Canonical and Standard Forms of L.P.P.	14 hours
Unit-II	Linear Programming Problem: Simplex Method Introduction - The Computational Procedure - Use of Artificial Variables - Big M-method - Degeneracy in Linear Programming - Applications of Simplex Method.	13 hours
Unit-III	Transportation Problem: LP formulation of the Transportation Problem - Existence of Solution in TP - The Transportation Table - Loops in Transportation Tables - Finding an initial basic feasible solution - North West corner rule - Vogel's approximation Method-Test for Optimality - Determining the Net evaluations (The uv method) - Transportation algorithm (MODI Method) - Some exceptional cases - Unbalanced Transportation Problem.	13 hours
Unit-IV	Assignment & Replacement Problem: Mathematical Formulation of the Assignment Problem - Solution of Assignment Problem - Hungarian Assignment method - Replacement of equipment / Assert that deteriorates gradually - Case (i) Value of money does not change with time Case (ii) Value of money changes with time - Selection of best equipment amongst two - Simple problems.	13 hours

Unit-V	Queueing Theory: Queueing System - Elements of a Queueing System - Operating characteristics of a Queueing system - Poisson Queueing System Model I : (M/M/ 1): (∞/FIFO) Model III : (M/M/ 1): (N/FIFO) Model V : (M/M/ C): (∞/FIFO) Model VI : (M/M/ C): (N/FIFO) Simple Problems.	12 hours

Text Book	Kanti Swarup, Gupta P. K and Man Mohan, *Operations Research*, Sultan Chand & Sons, New Delhi, 2014.
Reference Books	1. Taha H. A, *Operation Research - An introduction*, Prentice Hall of India Pvt Ltd, New Delhi, 2006. 2. Phillips T, Ravindran A and Solberg J, *Operations Research: Principles and Practice*, John Willey & Sons, 1976.

(MATHEMATICAL DERIVATIONS IN ALL UNITS MAY BE OMITTED).

Department	**Mathematics**	
Course	**B. Sc.**	**Effective From the Year : 2014**
Subject code : 14UMSNA1 **Title : NME QUANTITATIVE APTITUDE - I**		
Hrs/ Week	1	**Credits : 2**
Units	Contents	Hrs
Unit-I	Operation on numbers: Introduction - Face value - Place value - Various types of numbers - Simple problems.	3 hours
Unit-II	HCF and LCM of numbers: Factors and multiples - HCF and GCD - Factorization method - Division method - Simple problems.	3hours
Unit-III	Ratio and Proportion: Ratio - Proportion - Simple problems.	3 hours
Unit-IV	Profit and loss: Introduction - Cost price - Selling price - Profit and loss - Simple Problems.	2 hours
Unit-V	Odd man out and Series: Directions for odd man out and series.	2 hours
Text Book	Aggarwal R. S, *Quantitative Aptitude*, S. Chand & Company Ltd, Ram Nagar, New Delhi, 2013.	

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC07 **Title : STATICS**		
Hrs/ Week	4	**Credits : 4**
Objectives	The prime objective of this paper is to introduce the concepts about the forces, resultant force of more than one forces acting on a surface, friction and center of gravity and simple related problems. At the end of the course, learner will be well trained in handling these concepts.	
Unit	**Contents**	**Hrs**
Unit-I	Forces acting at a point – Simple problems	12 hours
Unit-II	Parallel forces and Moments – Simple problems	10 hours
Unit-III	Couples - Simple problems	12 hours
Unit-IV	Equilibrium of three forces acting on a rigid body, coplanar forces – Simple Problems.	6 hours
Unit-V	Friction and Centre of gravity – Simple problems.	10 hours
Text Book	Venkatraman, M. K. (1990). *Statics.* Sixth Edition. Agasthiar publications.	
Reference Books	1. Dharmapadam, A. V. (1993). *Statics*. Chennai: S. Viswanathan printers and publishers Pvt. Ltd. 2. Duraipandian, P and Laxmi Duraipandian. (1985). *Mechanics.* Ram Nagar, New Delhi: S. Chand & Co. Pvt. Ltd.	

Department	**Mathematics**	
Course	**B.Sc.**	**Effective From the Year : 2014**
Subject code : 14UMSC08 **Title : OPERATIONS RESEARCH -II**		
Hrs/ Week	5	Credits : 4
Objectives	The prime objective of this paper is to introduce certain OR techniques such as Game theory, sequencing and networking models to help the students to develop logical reasoning for applying mathematical tools to managerial and other life oriented problems	
Units	Contents	Hrs
Unit-I	Games and strategies: Two person zero sum games - Some basic terms - The Maximin - Minimax principle - Games without Saddle points - Mixed strategies - Graphical Solution of 2xn and mx2 games	13 hours
Unit-II	Sequencing problems: Problem of Sequencing - Basic terms used in Sequencing - Processing n jobs through 2 machines Processing n jobs through k-machines Processing 2 jobs through k-machines.	13 hours
Unit-III	Inventory control: Types of inventories - Reasons for carrying inventories - The inventory decisions - Cost associated with inventories - Factors affecting inventory control - The concept of EOQ - Deterministic inventory problems with no shortages Case (i) The fundamental Problem of EOQ Case (ii) Problem of EOQ with finite replenishment (Production).	14 hours
Unit-IV	Inventory control: Deterministic inventory Problems with shortages Case (i) Problem of EOQ with instantaneous Production and variable order cycle Case (ii) Problem of EOQ with instantaneous Production and Fixed order cycle. Case (iii) Problem of EOQ with finite replenishment (Production). Problem of EOQ with price breaks Case (i) Problem of EOQ with one price break Case (ii) Problem of EOQ with more than one price break.	13 hours

Unit-V	Network scheduling by PERT/CPM: Network: Basic compounds - Logical Sequencing - Rules of Network constructions - Critical Path Method (CPM) - Probability considerations in PERT - Distinction between PERT & CPM - Simple Problems.	12 hours

Text Book	Kanti Swarup, Gupta P.K. & Man Mohan, *Operations Research* (2014), Sultan Chand & Sons, New Delhi.
Reference Books	1. Taha H. A, *Operation Research - An introduction,* Prentice Hall of India Pvt Ltd, New Delhi, 2006. 2. Philips T, Ravindran A and Solberg J, *Operations Research: Principles and Practice*, John Willey & Sons, 1976.

(MATHEMATICAL DERIVATIONS IN ALL UNITS MAY BE OMITTED)

Department	**Mathematics**	
Course	**B. Sc.**	**Effective From the Year :2014**
Subject code : 14UMSNA2 **Title : NME QUANTITATIVE APTITUDE - II**		
Hrs/ Week	**1**	**Credits : 2**
Units	Contents	Hrs
Unit-I	Percentage: Introduction - Important facts and family - Concept of percentage - Simple problems.	3 hours
Unit-II	Simplification: Introduction - BODMAS rule - Modulus of a real number - Simple problems.	3 hours
Unit-III	Problems on ages: Problems on ages - Simple problems.	3 hours
Unit-IV	Time and work: Time and work - Simple problems.	2 hours
Unit-V	Problems on trains: Problems on trains with solved examples.	2 hours
Text Book	Aggarwal R. S, *Quantitative Aptitude,* S. Chand & Company Ltd, Ram Nagar, New Delhi, 2013.	

Department	**Mathematics**	
Course	**B. Sc.**	**Effective From the Year :2014**
Subject code : 14UMSC09 **Title : MODERN ALGEBRA**		
Hrs/ Week	6	**Credits : 4**
Objectives	Modern Algebra is a language of mathematics. Studying algebra develops confidence, improves logical thinking and enhances what is called mathematical maturity, all needed for developing and establishing mathematical facts and for solving problems. The major objective of this course is to provide the students an introduction to set theory, relations, functions, algebraic system of axioms, algebraic structures such as Groups, Rings and Fields. The course promotes a better understanding of algebra and provides an adequate foundation for further study in abstract algebra and its applications in various branches of Mathematics	
Units	Contents	Hrs
Unit-I	Set theory - Mappings - Definition of a Group - Some Examples of Groups - Some preliminary Lemmas - Subgroups.	15 hours
Unit-II	A Counting principle - Normal Subgroups and Quotient Groups - Homomorphisms.	16 hours
Unit-III	Automorphisms - Cayley's Theorem - Permutation Groups.	16 hours
Unit-IV	Definition and Examples of Rings - Some Special Classes of Rings - Homomorphism - Ideals and Quotient Rings..	16 hours
Unit-V	More Ideals and Quotient Rings - The Field of Quotients of an Integral Domain - Euclidean Rings - A Particular Euclidean Ring.	15 hours
Text Book	Herstein, I. N, *Topics in Algebra*, 2nd Edition, Wiley India Pvt. Ltd, New Delhi, 2010.	
Reference Books	1. Herstein I. N, *Abstract Algebra*, Prentice-Hall international, inc, 1996. 2. Surjeetsingh, Qazizameeruddin, *Modern Algebra*, Vikas Publishing House Pvt. Ltd, Second Edition, 1975. 3. Bhattacharya. P. B, Jain S. K, *A first course in group theory*, Wiley Eastern Pvt. Ltd, 1972.	

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC10 **Title : REAL ANALYSIS - I**		
Hrs/ Week	6	**Credits : 4**
Objectives	One of the higher mathematical divisions, mathematical analysis provides the students a transition from elementary calculus to advanced courses in modern analysis. The course includes real and complex number systems, set theory, elements of point set topology, metric spaces and continuous functions. On completion of the course the learners are expected to have obtained a strong foundation for further study in analysis.	
Unit	**Contents**	**Hrs**
Unit-I	The Real and Complex number Systems: Introduction - The field axioms - The order axioms - Intervals - Integers - The unique factorization theorem for integers - Rational numbers - Irrational numbers - Upper bounds, maximum element, least upper bound - The completeness axiom - Some properties of the supremum - Properties of the integers deduced from the completeness axiom - The Archimedean property - Absolute values and the triangle inequality - The Cauchy Schwatz inequality - Plus and minus infinity and the extended real number system R*.	15 hours
Unit-II	Some Basic Notations of Set Theory: Notations - Ordered pairs - Cartesian product of two sets - relations and functions - One to one functions and inverses - Composite functions - Sequences –Similar sets-Finite and infinite sets - Countable and uncountable sets - Uncountability of the real number system - Set algebra - Countable collections of countable sets.	15 hours

Unit-III	Elements of Point Set Topology: Euclidean space R^n - Open balls and open sets in R^n - The structure of open sets in R^1 - Closed sets - Adherent points, Accumulation points – Closed sets and adherent points - The Bolzano-Weierstrass theorem - The Cantor intersection theorem - Lindelof covering theorem - The Heine Borel covering theorem - Compactness in R^n .	16 hours
Unit-IV	Metric spaces - Point set topology in metric spaces - Compact subsets of a metric space - Boundary of a set. Limits and Continuity: Convergent sequences in a metric space - Cauchy sequences - Complete metric spaces - Limit of a function - Limits of vector valued functions.	15 hours
Unit-V	Continuous function - Continuity of composite functions - Continuity and inverse images of open or closed sets - connectedness - Uniform continuity - Uniform continuity and compact sets - Discontinuities of real valued functions - Monotonic functions.	14 hours
Text Book	Tom. M. Apostal. (1974). *Mathematical Analysis.* Second Edition. Addison Wesley.	
Reference Books	1. Walter Rudian. (1976). *Principles of Mathematical Analysis*. Third Edition. McGraw- Hill. Inc. 2. Ralp. P. Boas. (1960). *A primer of Real function*. The mathematical Association of America.	

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC11 **Title : COMPLEX ANALYSIS – I**		
Hrs/ Week	5	**Credits : 4**
Objectives	To enable the learners (i) To understand in depth the algebraic and geometric nature of complex numbers. (ii) To get a chance to explore the concept of analytic functions, the theory of Power Series, Exponential functions and Trigonometric functions.	

Unit	**Contents**	**Hrs**
Unit-I	**The Algebra of Complex Numbers:** Arithmetic operations - Square Roots – Justification - Conjugation, Absolute Value - Inequalities.	12 hours
Unit-II	**The Geometric Representation of Complex Numbers:** Geometric Addition and Multiplication - The Binomial Equation - Analytic Geometry - The Spherical Representation.	12 hours
Unit-III	**Introduction to the Concept of Analytic Function:** Limits and Continuity - Analytic functions - Polynomials - Rational Functions.	12 hours
Unit-IV	**Elementary Theory of Power Series:** Sequences - Series - Uniform Convergence – Power Series - Abel's Limit Theorem.	13 hours
Unit-V	**The Exponential and Trigonometric functions**: The Exponential - The Trigonometric functions - The Periodicity - The Logarithm.	13 hours
Text Book	Lars V.Ahlfors. (1979). *Complex Analysis.* Tjird Edition. McGRAW HILL International.	

Reference Books	1. Ruel V. Churchill and others. (1974). *Complex Variables and Applications.* Third Edition. Mc Graw Hill. 2. Philips, E.G. *Functions of a Complex Variable*. Longman Group Limited. *3.* Boas, R.P. (1987). *Invitation to Complex Analysis*. New York: Random house.

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC12 **Title : THEORY OF NUMBERS**		
Hrs/ Week	5	**Credits : 4**
Objectives	This course exposes the elementary basic theory of numbers and several famous theorems, function and some unsolved problems about primes to the students in order to enable them to deeper their understanding of the subject.	

Unit	**Contents**	**Hrs**
Unit-I	**Basic Representation:** Principles of Mathematical induction - The Basis Representation Theorem - The Fundamental Theorem of Arithmetic - Euclid's Division Lemma, Divisibility - The linear Diophantine Equation - The fundamental theorem of Arithmetic.	12 hours
Unit-II	**Combinational and Computational Number Theory:** Permutations and combinations - Fermat's Little Theorem (Statement only) - Wilson's Theorem (Statement only) - Fundamentals of Congruences - Basic properties of congruences - Residue systems.	12 hours
Unit-III	**Solving Congruences:** Linear congruences - the theorems of Fermat and Wilson Revisited - The Chinese Remainder theorem - Polynomial congruences.	12 hours
Unit-IV	**Arithmetic Functions:** Combinational study of $\Phi(n)$ - Formulae for $d(n)$ and $\sigma(n)$ - Multiplicative arithmetic functions - The Mobius Inversion Formula.	13 hours
Unit-V	**Primitive Roots:** Properties of Reduced Residue Systems - Primitive Roots module p - Prime numbers - Elementary properties of $\pi(x)$ - Tchebychev's theorem - some unsolved problems about primes.	13 hours

Text Book	George E. Andrews. (1989). *Number Theory*. HPS (India).
Reference Books	1. David M. Burten. (1997). *Elementary number theory*. McGraw-Hill. 2. Kumaravelu et al. (2002). *Elements of number theory*. Nagerkovil: SKV. 3. Malik, S.B. (1998). *Basic number theory*. Vikas publishing House Pvt Ltd. 4. Niven et al. (1985). *An Introduction to the theory of numbers*. Wiley eastern Ltd. 5. Telang. (1984). *Number theory*. Tata McGraw- Hill publishing Company Ltd. 6. G.H.Hardy et.al. (1960). *An Introduction to the theory of numbers.* Oxford. 7. Hsiung, C.Y. (1995). *Elementary theory of numbers.* Allied Publishers.

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC13 **Title : PROGRAMMING IN 'C'**		
Hrs/ Week	4	**Credits : 3**
Objectives	C is a general- purpose structured programming language that is powerful, efficient and compact. The programming language C finds a wide variety of applications in the development of software. This course provides the students with all the fundamental concepts of the C language with some practical experience. Also helps the students to develop their programming skills and to build large programs.	
Unit	**Contents**	**Hrs**
Unit-I	History of C - Importance of C - Character set - Keywords - Constants - Variables - Data types - Declaration of variables - Assigning values to variables - Defining symbolic constants - Arithmetic, Relational, Logical, Assignment, increment, Decrement and conditional operators-Arithmetic expressions - Evaluation of expressions - Precedence of arithmetic operators - Type conversions in expressions - Operator precedence - Mathematical functions - Reading a character - Writing a character - Formatted input and output.	12 hours
Unit-II	Simple if statement - If … else statement - Nesting of if … else statements - else if ladder - switch statement - go to statement - while statement - do while statement - for statement - Jumps in loops - Simple programs.	10 hours
Unit-III	One dimensional arrays - Two dimensional arrays - Declaring and initializing string variables - Reading strings from terminal - Writing strings to screen Arithmetic operations on characters – Putting strings together comparison of two strings - String handling functions – Table of strings - Simple programs.	12 hours

Unit-IV	Need for user defined functions - The form of C functions - Return values and their types – Calling a function - No arguments and no return values - Arguments but no return values - Arguments with return values - handling of non integer functions – Functions returning nothing Nesting of C functions - recursion - Functions with arrays – Simple programs.	6 hours
Unit-V	Understanding pointers - Accessing the address of a variable - Declaring and initializing pointers - Accessing a variable through its pointer - Pointer expressions – Pointer increments and scale factor - Pointers and arrays - Pointers and characters strings - Pointers as function arguments - Pointers to functions - Simple programs.	10 hours
Text Book	Balagurusamy, E. (2004). *Programming in ANSI C*. Third Edition. Tata McGRAW Hill Publishing Company Limited.	
Reference Books	1. Kernighan, B.W. and Ritchie, D.M. (1997). *The C programming language.* Prentice Hall. 2. S.G.Kochan, S.G. (1983). *Programming in C.* Hyden. 3. Venugopal, K.R. and Prasad, S.R. (1997). *Programming with C.* Tata McGRAW Hill Publishing company limited. 4. Schaum series. *Programming with C.*	

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC14 **Title** **:** PROGRAMMING LAB IN 'C'		
Hrs/ Week	2	**Credits : 2**

List of programs:

1. Program to convert the given temperature in Fahrenheit to Celsius.
2. Program to convert days into months and days.
3. Program to find the solution of quadratic equation.
4. Program for finding Fibonacci sequence.
5. Program to sort a list and find its median.
6. Program to sort a list in ascending / descending order.
7. Program to calculate mean and standard deviation of a given series of numbers.
8. Program for finding the addition of two matrices.
9. Program for finding the multiplication of two matrices.
10. Program to find trace of a square matrix.
11. Program to sort a list of strings in alphabetical order.
12. Program to compute nCr value.
13. Program to check whether the number is prime or not.
14. Program to check whether the year is leap year or not.
15. Program to illustrate the use of pointers in one dimensional array.

Department	**Mathematics**	
Course	**B. Sc.**	**Effective From the Year : 2014**
Subject code :14UMSSA1 **Title : MATHEMATICS IN FINANCE-I**		
Hrs/ Week	**1**	**Credits : 2**
Units	Contents	Hrs
Unit I	Financial statement analysis: Introduction - Ratio analysis -Meaning and Rationals - Basis of comparison.	3 hours
Unit II	Types of ratios - Liquidity ratio - Net working capital - Current ratios - Acid test/Quick ratios.	3 hours
Unit III	Turnover ratio – Defensive - Interval ratio - Leverage/Capital structure ratio – Debt - Equity Ratios - Debt to total capital ratio.	3 hours
Unit IV	Coverage ratios - Profitability ratios - profitability ratios related to sales - Profit margin - Expenses ratio.	2 hours
Unit V	Profitability ratios related to investments: Return on investment - Importance of ratio analysis.	2 hours
Text Book	Khan M.Y and Jain P. K, *Financial Management,* Tata McGraw Hill Publishing Company Ltd, New Delhi, 1990.	
Reference Books	1. Aswath Damodaran, *Corporate Finance, Theory and Practice*, John Wiley and Sons, Inc, 2007. 2. Prasanna Chandra, *Managing Investment*, Tata McGraw-Hill Publishing Company Ltd, New Delhi, 1998.	

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC15 **Title : LINEAR ALGEBRA**		
Hrs/ Week	6	**Credits : 4**
Objectives	To enable the students to study how to solve system of linear algebraic equations, a new algebraic structure vector space and its properties, linear transformations on vector spaces and their relation between matrices.	
Unit	**Contents**	**Hrs**
Unit-I	**Linear equations:** Fields - Systems of linear equations Matrices and elementary row operations - Row reduced echlon matrices Matrix multiplication – Invertible matrices.	15 hours
Unit-II	**Vector Spaces:** Vector spaces – Subspaces - Bases and dimension Coordinates - Summary of row equivalence.	15 hours
Unit-III	**Linear transformation:** Linear transformations - The algebra of linear Transformations - Isomorphism.	16 hours
Unit-IV	Representation of transformations by matrices - Linear functionals.	15 hours
Unit-V	The double dual - The transpose of a linear transformation.	14 hours
Text Books	Kenneth Hoffman and Ray Kunze. (2010). *Linear Algebra.* Second Edition. Prentice Hall of India.	
Reference Books	1. Herstein, I.N. (1981). *Topics in algebra*. Vikas Publishing House Pvt. Ltd. 2. Schaum Series. (1988). *Linear Algebra.* McGraw-Hill, bare company. 3. Kumaresan, S. (2001). *Linear Algebra.* Prentiee-Hall of India. 4. Hadley, G. (1988). *Linear Algebra.* Narosa, Publising House. 5. Serge Lang. (2005). *Introduction to linear Algebra*. Springer.	

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC16 **Title : REAL ANALYSIS – II**		
Hrs/ Week	6	**Credits : 4**
Objectives	To enable the learners (i) to get introduction to some of the advanced topics in Real Analysis (ii) to understand and to have a chance to study in depth advanced topics like functions of bounded variations and Riemann- Stieltjes integrals.	

Unit	**Contents**	**Hrs**
Unit-I	Derivatives: Introduction - Definition of derivative - Derivatives and continuity - Algebra of Derivatives - The chain rule - One sided Derivatives and infinite derivatives - Functions with nonzero derivative - Zero derivatives and local extrema - Rolle's theorem - The Mean Value Theorem for derivatives - Intermediate value theorem for derivatives - Taylor's formula with remainder.	15 hours
Unit-II	Functions of Bounded Variations: Introduction - Properties of monotonic functions - Functions of bounded variations - Total variations - Additive property of total variation - Total variation on [a, x] as a function of x - Functions of bounded variation expressed as the difference of increasing functions-Continuous functions of bounded variation.	14 hours
Unit-III	The Riemann-Stieltjes Integral: Introduction - Notation - The definition of Riemann-Stieltjes Integral - Linear properties - Integration by parts - Change of variable in Riemann-Stieltjes integral - Reduction to a Riemann integral - Step functions as integrators - Reduction of a Riemann-Stieltjes integral to a finite sum - Euler's	

	summation formula.	16 hours
Unit-IV	Monotonically increasing integrators - Upper and lower integrals - Additive and linearity properties of upper and lower integrals - Riemann's condition – Comparison theorems - Integrators of bounded variation - Sufficient conditions for existence of Riemann-Stieltjes integrals - Necessary conditions for existence of Riemann-Stieltjes integrals.	15 hours
Unit-V	Mean Value Theorems for Riemann-Stieltjes Integrals - The integral as a function of the interval - Second fundamental theorem of integral calculus - Change of variable in a Riemann integral - Second Mean-Value Theorem for Riemann integrals.	15 hours
Text Book	Tom. M. Apostal. (1974). *Mathematical Analysis.* Second Edition. Addison Wesley.	
Reference Books	1. Goldberg, R.R. (1973). *Methods of Real Analysis*. Oxford and IBH Publishing Co. 2. Soma Sundaram, D. and Choudhary, B. (1996). *A first course in Mathematical Analysis.* Narosa Publishing House. 3. Walter Rudian. (1976). *Principles of Mathematical Analysis*. Third Edition. McGraw- Hill. Inc.	

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC17 **Title : COMPLEX ANALYSIS – II**		
Hrs/ Week	5	**Credits : 4**
Objectives	***On completion of the course the learners are expected to*** (i) have a good understanding of conformality and linear transformations (ii) have studied fundamental theorems, Cauchy' integral formula, local properties of analytic functions and related results. (iii) have developed a solid base for further study.	

Unit	**Contents**	**Hrs**
Unit-I	Conformality: Arcs and closed curves - Analytic functions in Regions – Conformal mapping - Length and area.	14 hours
Unit-II	Linear Transformations: The Linear group - The cross ratio - Symmetry – Oriented circles - Families of circles.	14 hours
Unit-III	Fundamental Theorems: Line Integrals - Line Integrals as Functions of Arcs –Cauchy's Theorem for a Rectangle - Cauchy's Theorem in a Disk.	15 hours
Unit-IV	Cauchy's Integral Formula: The Index of a point with respect to a closed curve – The Integral formula - Higher Derivatives.	16 hours
Unit-V	Local Properties of Analytic Functions: Removable singularities, Taylor are Theorem- Zeros and poles - The Local mapping - The Maximum principle.	16 hours
Text Book	Lars V. Ahlfors. (1979). *Complex Analysis.* Tjird Edition. Mc GRAW HILL International.	
Reference	1. Ruel V. Churchill and others. (1974). *Complex Variables and*	

Books	*Applications.* Third Edition. Mc Graw Hill. 2. Philips, E.G. *Functions of a Complex Variable*. Longman Group Limited. *3.* Boas, R.P. (1987). *Invitation to Complex Analysis*. New York: Random house.

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC18 **Title : DISCRETE MATHEMATICS**		
Hrs/ Week	5	**Credits : 4**
Objectives	Discrete mathematics is the theoretical foundation for much of today's advanced technology. In this paper a set of topics that are of genuine use in computer science and elsewhere are identified and combined together in a logically coherent fashion, to enable the students to get a good training in these topics which will inevitably lead the students in the direction of clear thinking, sound reasoning and a proper attitude towards the applications of mathematics in computer science and other related fields.	
Unit	**Contents**	**Hrs**
Unit-I	**Recurrence Relations and Generating functions:** Recurrence - an introduction; Polynomials and their Evaluations; Recurrence Relations; Solution of Finite order Homogeneous (linear) Relations.	8 hours
Unit-II	**Recurrence Relations and Generating functions:** Solution of Non-homogeneous relations; Generating Functions; Some common recurrence relations; Primitive Recursive functions.	7 hours
Unit-III	**Logic:** Introduction; TF-Statements; Connectives; Atomic and Compound Statements; Well Formed (statement) Formulae; The Truth table of a Formulae.	6 hours
Unit-IV	**Logic:** Tautology; Tautological Implications and Equivalence of Formulae; Replacement Process; Functionally Complete Sets of Connectives and Duality Law; Normal Forms; Principal Normal Forms.	7 hours
Unit-V	**Lattices and Boolean algebra:** Lattices; Some properties of Lattices; New lattices; Modular and distributive lattices.	7 hours
Text Book	Venkataraman, M.K. Sridharan, N. Chandrasekaran, N. (2000). *Discrete Mathematics.* The National Publishing Company.	

Reference Books	1. Ralph P. Grimaldi. (1994). *Discrete and Combinatorial Mathematics - An applied introduction.* Third Edition. Addison-wesley Publishing Company. *1.* Tremblay, J.P. and Manohar, R. (2001). *Discrete Mathematical Structures with Applications to Computer Science*. TATA Mc Graw- Hill.

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC19 **Title : OBJECT ORIENTED PROGRAMMING WITH C++**		
Hrs/ Week	4	**Credits : 3**
Objectives	C++ is an extension of C language which is widely used all over the world. It is a powerful modern language that combines the power, elegance and flexibility of C and the features of object oriented programming. C++ offers significant software engineering benefits over C. This course content enables the students to know all needed about C++ and object oriented programming and also to meet the global requirements in software industries.	
Unit	**Contents**	**Hrs**
Unit-I	Beginning with C++ - Tokens - Expressions and Control structures.	12 hours
Unit-II	Functions in C++ - Constructors and Destructors.	10 hours
Unit-III	Classes and objects	12 hours
Unit-IV	Operator overloading and Type conversions, Pointers,Virtual Functions and Polymorphism.	6 hours
Unit-V	Inheritance: Extending classes.	10 hours
Text Book	Balagurusamy, E. *Object Oriented Programming with C++*. New Delhi: Tata Mc Graw Hill Publishing Company.	
Reference Books	1. Robert lafore. (1992). *Object Oriented Programming in turbo C++*. Waite group. 2. Bjarne Stroustroup. *(1991). The C++ Programming language.* Addison – Wesley. 3. Herbert Schildt Osborne. *(1994). Teach Yourself C++*. Mc Graw Hill.	

Department	Mathematics	
Course	B.Sc	**Effective From the Year :** 2014
Subject code : 14UMSC20 **Title : PROGRAMMING LAB IN OOP WITH C++**		
Hrs/ Week	2	**Credits : 2**

List of programs:

1. Program to find the Mean and variance
2. Program to find the largest of two numbers using nesting of member functions
3. Program to illustrate the use of array of objects
4. Program to illustrate the use of objects as arguments
5. Program to swap private data of classes using friend function
6. Program to illustrate overloaded constructors
7. Program to illustrate matrix multiplication
8. Program to illustrate the use of 'new' in constructors
9. Program to illustrate overloading + operators
10. Program to explain single inheritance
11. Program to illustrate multilevel inheritance
12. Program to explain hybrid inheritance
13. Program to illustrate the use of initialization lists in the base and derived constructors
14. Program to illustrate the use of pointers to objects
15. Program to illustrate runtime polymorphism

Department	**Mathematics**	
Course	**B.Sc.**	**Effective From the Year :2014**
Subject code :14UMSSA2 **Title : MATHEMATICS IN FINANCE-II**		
Hrs/ Week	**1**	**Credits : 2**
Units	Contents	Hrs
Unit I	Capital budgeting principle and techniques: Nature of capital budgeting-Importance-Difficulties-Rationale-Kinds.	3 hours
Unit II	Data requirement: Identifying relevant cash flows: Accounting profit and cash flows-Incremental cash flow-Effect of taxes-Conventional & non-conventional cash flows	3 hours
Unit III	Cash flow estimates-Determination of relevant cash flows-Single proposal-Replacement situations-Mutually exclusive situations	3 hours
Unit IV	Evaluations techniques: Unsophisticated or traditional-Average rate of return method-Payback method	2 hours
Unit V	Sophisticated or time –adjusted- net present value method-internal rate of return method.	2 hours
Text Book	Khan M.Y and Jain P.K (1990), *Financial Management* Tata McGraw-Hill Publishing Company Ltd, New Delhi.	
Reference Books	1. Aswath Damodaran (2007), *Corporate Finance*, Theory and Practice, John Wiley and Sons, Inc. 2. Prasanna Chandra (1998), *Managing Investment*,Tata McGraw- Hill Publishing Company Ltd, New Delhi.	