

PERIYAR UNIVERSITY

SALEM – 636011

B.Sc. MATHEMATICS

New Regulations and Syllabus Under Choice Based Credit System.

Effective from the academic year 2008-2009 onwards.

BOARD OF STUDIES IN MATHEMATICS

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|--|----------|
| 1. Selvi.P.Sivakami,
Lecturer SG in Mathematics,
NKR Govt Arts College for Women,
Namakkal. | Chairman |
| 2. K.Rangasamy,
Lecturer SG in Mathematics,
Govt Arts College (M),
Krishnagiri – 635 001. | Member |
| 3. Thiru.R.Palaniappan,
Lecturer SG in Mathematics,
Govt Arts College (Autonomous),
Salem – 636 007. | Member |
| 4. Tmt. R.Baghyam,
Lecturer SG in Mathematics,
Govt Arts College,
Salem – 636 008. | Member |
| 5. Tmt.V.Alli,
Lecturer SG in Mathematics,
JKK Nataraja college of Arts and Science,
Komarapalayam – 638 183. | Member |
| 6. Dr.C.Durairajan,
Lecturer (SG) in Mathematics,
Bharathidasan University,
Tiruchirapalli – 620 023. | Member |

1. OBJECTIVES OF THE COURSE

Mathematics is a key to success in the field of science and engineering. Today, the students need a thorough knowledge of fundamental basic principles, methods, results and a clear perception of the power of mathematical ideas and tools to use them effectively in modeling, interpreting and solving the real world problems. Mathematics plays an important role in the context of globalization of Indian economy, modern technology, and computer science and information technology. This syllabus is aimed at preparing the students to hope with the latest developments and compete with students from other universities and put them on the right track.

2. ELIGIBILITY FOR ADMISSION

A Pass in the higher secondary Examination of TamilNadu Higher Secondary Board or some other Board accepted by the Syndicate as equivalent thereto with Mathematics (other than Business mathematics) as one of the subjects.

3. DURATION OF THE COURSE

The course of study shall be based on semester pattern with internal assessment under Choice Based Credit System. The course shall consist of six semesters and a total period of three years with 140 credits. The course of study will comprise of the following subjects according to the syllabus and is given in the scheme of Examinations and books prescribed from time to time.

4. EXAMINATIONS

The theory of examination shall be of three hours duration for each paper at the end of each semester. The candidate failing in any subject(s) will be permitted to appear for each failed subject(s) in the subsequent examinations. The practical examinations for UG course shall be conducted at the end of the even semesters only.

5. SCHEME OF EXAMINATIONS

The Scheme of examinations for different semesters shall be as follows:

B.Sc .Mathematics – Course Structure under Choice Based Credit System.
(Applicable to the candidates admitted from the year 2008 – 2009 onwards).

Semester	Part	Course Code	Course Title	Instruction Hours / Week				Credit	Exam Hours	Marks		
				Lecture	Tutorial	Practical	Total			Internal	External	Total
I	I	08UFT A01	Tamil Course –I	4	2	-	6	3	3	25	75	100
	II	08UFE N01	English Course –II	4	2	-	6	3	3	25	75	100
	III	08UM A01	Core Course I- Algebra & Trigonometry	4	2	-	6	5	3	25	75	100
			Allied I – Course I – Theory	5	-	-	5	4	3	25	75	100
			Allied I - Practical	-	-	2	2	-	*	-	-	-
	IV	08UES 01	Environmental studies	1	-	-	1	-	*	-	-	-
		08UVE 01	Value Education	2	-	-	2	2	3	25	75	100
		08UM AS01	Skill Based Elective Course I-	2	-	-	2	2	3	25	75	100
II	I	08UFT A02	Tamil Course II	4	2	-	6	3	3	25	75	100
	II	08UFE N02	English Course II	4	2	-	6	3	3	25	75	100
	III	08UM AE01	Core Course II- Calculus	5	-	-	5	4	3	25	75	100
			Elective course I- From Group A	5	-	-	5	5	3	25	75	100
			Allied I - Course II- Theory	5	-	-	5	3	3	25	75	100
			Allied I - Practical	-	-	2	2	-	*	-	-	-
	IV	08UES 01	Environmental studies -	1	-	-	1	2	2	25	75	100
III	I	08UFT A03	Tamil course III	4	2	-	6	3	3	25	75	100
	II	08UFE N03	English Course III	4	2	-	6	3	3	25	75	100

	III	08UM A03	Core Course III – Differential Equations & Laplace Transforms	4	-	-	4	4	3	25	75	100
		08UM A04		5	-	-	5	4	3	25	75	100
			Core Course IV – Statics	5	-	-	5	3	3	25	75	100
			Allied II- Course I- Theory	-	-	2	2	**	-	-	-	-
			Allied II- Practical									
	IV	08UNE 01	Non Major Elective Course I	2	-	-	2	2	3	25	75	100
IV	I	08UFT A04	Tamil Course IV	4	2	-	6	3	3	25	75	100
	II	08UFE N04	English Course IV	4	2	-	6	3	3	25	75	100
	III	08UM A05	Core Course V- Dynamics	5	-	-	5	4	3	25	75	100
			Allied II Course II – Theory	4	-	-	4	3	3	25	75	100
				-	-	3	3	3	2	25	75	100
					Allied II – Practical							
	IV	08UM AS02	Skill Based Elective Course II	2	-	-	2	2	3	25	75	100
		08UM AS03	Skill Based Elective Course III	2	-	-	2	2	3	25	75	100
					2	-	-	2	2	3	25	75
		08UNE 02	Non Major Elective Course II									

V	III	08UM A06	Core Course VI- Algebraic structures	6	-	-	6	5	3	25	75	100
		08UM A07	Core Course VII- Sequence and series	5	-	-	5	5	3	25	75	100
		08UM A08	Core Course VIII – Discrete Mathematics	5	-	-	5	5	3	25	75	100
		08UMA09	Core Course IX – Numerical Analysis	5	-	-	5	5	3	25	75	100
		08UM AE02	Elective Course II –From Group B	5	-	-	5	5	3	25	75	100
	IV	08UM AS04	Skill Based Elective Course IV –	2	-	-	2	2	3	25	75	100
		08UM AS05	Skill based Elective Course V	2	-	-	2	2	3	25	75	100
VI	III	08UM A10	Core Course X –Linear Algebra	6	-	-	6	5	3	25	75	100
		08UM A11	Core course XI –Real Analysis	6	-	-	6	5	3	25	75	100
		08UM A12	Core Course XII – Complex Analysis	6	-	-	6	5	3	25	75	100
		08UM A13	Core Course XIII- Graph Theory	5	-	-	5	5	3	25	75	100
		08UM AE03	Elective Course III –From Group	5	-	-	5	5	3	25	75	100
	IV	08UM AS06	Skill Based Elective Course VI	2	-	-	2	2	3	25	75	100

*-Examination at the end of Second Semester.

** -Examination at the end of Fourth Semester

ALLIED SUBJECTS:-**PHYSICS / CHEMISTRY / STATISTICS**

Any two of the above subjects can be chosen as Allied subjects .

Subject	Code
Allied Physics – I	08UPHA01
Allied Physics – II	08UPHA02
Allied Physics – Practical	08UPHAP01
Allied Chemistry – I	08UCHA01
Allied Chemistry –II	08UCHA02
Allied Chemistry – Practical	08UCHAP01
Allied Mathematical Statistics – I	08USTA01
Allied Mathematical Statistics – II	08USTA02
Allied Statistics – Practical	08USTAP01

ELECTIVE SUBJECTS :

Subject	Subject code
From Group A :	
Vector Analysis	U08MAE01
Financial Mathematics	U08MAE02
From Group B :	
Linear Programming	U08MAE03
Number Theory	U08MAE04
Combinatorics	U08MAE05
From Group C:	
Operations Research	U08MAE06
Astronomy	U08MAE07
Probability Theory	U08MAE08

SKILL BASED ELECTIVE COURSES:

Aptitude Examination - I	U08MAS01
Aptitude Examination – II	U08MAS02
Aptitude Examination -III	U08MAS03
Aptitude Examination – IV	U08MAS04
MATLAB	U08MAS05
CHILAB	U08MAS06

6. UNIFORMITY IN THE NUMBER OF UNITS IN EACH PAPER :

Each theory paper shall consist of five units. The Question paper shall consist of questions uniformly distributed among all the units.

For theory paper without practicals, **Max marks is 75.**

7. QUESTION PAPER PATTERN FOR ALL UG COURSES WITHOUT PRACTICAL :

Time : Three Hours

Maximum Marks :75

Part A: (10 x 2 = 20)
Answer ALL Questions

(Two Questions From Each Unit)

Part B : (5 x 5 = 25)

Answer ALL Questions

(One Question From Each Unit with internal choice)

Part C : (3 x 10 = 30)
Answer Any Three Questions out of Five Questions

(One Question From Each Unit)

8. PASSING MINIMUM:

The Candidates shall be declared to have passed the examination if the candidate secure not less than 30 marks in the University examination in each theory paper without practical .

9. CLASSIFICATION OF SUCCESSFUL CANDIDATES:

Candidates who secure not less than 60% of the aggregate marks in the whole examination shall be declared to have passed the examination in the First class .All other successful candidates shall be declared to have passed in the second class . Candidates who obtain 75% of the marks in the aggregate shall be deemed to have passed the examination in First Class with Distinction provided they pass all the examinations prescribed for the course at the first appearance. Candidates who pass all the examinations prescribed for the course in the first attempt and within a period of three academic years from the year of admission to the course only eligible for University Ranking.

10.COMMENCEMENT OF THIS REGULATION:

The CBCS regulations shall take effect from the academic year 2008-2009 ie, for the students who are admitted to the first year of the course during the academic year 2008-2009 and thereafter.

11. TRANSITARY PROVISION:

Candidates who were admitted to the UG course of study prior to 2008-2009 shall be permitted to appear for the examinations under those regulations for a period of three years ie, up to and inclusive of the examinations of April/May 2013. Thereafter they shall be permitted to appear for the examination only under the regulations then in force.

12. NOTE:

The NonMajor Elective Course Papers Syallabus will be given at the end of this book.

B.Sc. Mathematics – Course Structure under CBCS

First Year / First semester

Core course I – Algebra and Trigonometry

Course code :08UMA01

Max Marks :75

Unit I

Characteristic equation - Characteristic roots and Characteristic vectors – properties – problems - Cayley – Hamilton theorem (statement only) and its problems – Diagonalisation of Matrices – problems.

Unit II

Polynomial equations – Imaginary and Irrational roots – relation between roots and coefficients of equations – Symmetric functions of roots in terms of coefficients of third degree equation - problems.

Unit III

Sum of the powers of the roots of an equation – Newton's Theorem on the sum of the powers of the roots – Transformation of equations – Roots with sign changed – Roots multiplied by a given number – Reciprocal equations – problems.

Unit IV

To increase or decrease the roots of a given equation by a given quantity. Removal of terms - Square of the roots – Transformations in general – Descartes's rule of signs – problems.

Unit V

Expansions of $\sin n\theta$, $\cos n\theta$ and $\tan n\theta$ – Expansions of $\sin^n \theta$, $\cos^n \theta$ - Expansions of $\sin \theta$, $\cos \theta$ and $\tan \theta$ in terms of θ – Hyperbolic and inverse hyperbolic functions and its properties – Logarithm of a complex number – General principal values – problems.

Text Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Algebra-Volume I	T.K.Manickava sagam Pillai and S. Narayanan.	Vijay Nicole Imprints Pvt, Ltd,#c-7,Nelson Manickam Road,Chennai-600029	2004
2.	Trigonometry	T.K.Manickava sagam Pillai and S. Narayanan	Vijay Nicole Imprints Pvt, Ltd,#c-7,Nelson Manickam Road, Chennai-600029	2004.
3.	Algebra,calculus and Trigonometry	Dr.P.R. Vittal.	Margham publications,24,Rames waram Road, T.Nager,Chennai- 600017.	2000.

Reference Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Trigonometry.	N.P.Bali.	Krishna Prakaaaasan mandir,9, Shivaji Road,Meerut(UP)- 250001	1994.
2.	Algebra.	Burnside and Pantern.	Macmillen publishers,U.K.	1976.

First Year / First semester

Skill Based Elective Course I – Aptitude Examination - I

(This paper is common for both B.Sc Mathematics and B.Sc Mathematics (CA) Major students.)

Course Code – 08UMAS01

Max Marks :75

Unit I

Numbers , H.C.F. and L.C.M. of numbers , Decimal Fractions.

Unit II

Simplification , Square roots and Cube Roots , Average.

Unit III

Problems on numbers , problems on Ages.

Unit IV

Surds and Indices , Percentage , Profit and Loss.

Unit V

Ratio and Proportion , Partnerships.

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Quantitative Aptitude for competitive Examination	R.S.Aggarwal.	S.Chand and company Ltd,152,Anna salai,Chennai.	2001

First Year / Second Semester

Core Course II - Calculus

Course code :08UMA02

Max Marks :75

Unit I

Curvature - Radius of curvature , Circle of curvature and Center of curvature in Cartesian co-ordinates and Polar co-ordinates - Evolutes and Envelopes – definition - Method of finding envelopes - Problems in all sections.

Unit II

Asymptotes:- Definition - Methods of finding asymptotes of plane algebraic curves – special cases – problems. Slope of the tangent in polar co-ordinates - Angle of intersection of two curves - Pedal equation of a curve – Problems.

Unit III

Integration - Bernoulli's formula - Reduction formula for $\int_0^{\pi/2} \sin^n x \, dx$, $\int_0^{\pi/2} \cos^n x \, dx$, $\int_0^{\pi/4} \tan^n x \, dx$, $\int \sec^n x \, dx$, $\int \operatorname{cosec}^n x \, dx$, $\int \cos^m x \sin^n x \, dx$, $\int \cot^n x \, dx$, $\int_0^a x^n e^{ax} \, dx$, $\int e^{-x} x^n \, dx$, $\int x^m (\log x)^n \, dx$ - Problems for all the above cases.

Unit IV

Beta and Gamma functions – Definition – properties – problems - relation between Beta and Gamma functions - Applications to evaluation of definite integrals.

Unit V

Fourier series - Definition – Fourier coefficients – Fourier series of periodic functions of period 2π - Even and Odd functions – Half Range series – problems.

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Calculus Volvme. I	T.K.Manichava sagam Pillai and S.Narayanan	Vijay Nicole Imprints Pvt Ltd,#C-7,Nelson Chambers,115,Nelson Manickam Road,Chennai-600029	2004
2.	Calculus Volvme. II.	T.K.Manichava sagam Pillai and S.Narayanan	Vijay Nicole Imprints Pvt Ltd,#C-7,Nelson Chambers,115,Nelson Manickam Road,Chennai-600029	2004
3.	Calculus.	Dr.P.R.Vittal.	Margham publications , 24,Rameswaram road, T.Nagar,Chennai 17.	2000.

Reference Books :-

	Title of the Book	Author	Publishing Company	Year of Publication
1.	Calculus.	N.P.Bali.	Krishna prakasan Mandhir,9,Shivaji Road,Meerut.(UP)	1994
2.	Calculus	D.Sudha.	Emerald Publishers,135,Anna Salai,Chennai-600002	1988

First year / Second semester

Elective Course I - Vector Analysis

Course Code – 08UMAE01

Max Marks :75

Unit I

Vector differentiation: Limit of a vector function – continuity and derivative of vector function - Geometrical and Physical significance of vector differentiation - Partial derivative of vector function – gradient and directional derivative of scalar point functions – Equations of tangent plane and normal line to a level surface.

Unit II

Vector point function: Divergence and curl of a vector point function – solenoidal and irrotational functions – physical interpretation of divergence and curl of a vector point function.

Unit III

Vector identities – Laplacian operator.

Unit IV

Integration of vector functions – Line , surface and volume integrals.

Unit V

Gauss - Divergence Theorem – Green's Theorem – Stoke's Theorem (statement only). Verification of theorems and simple problems using the theorems.

Text Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Vector Analysis	P.Duraipandian and others	S.Viswanathan and co, 38, McnicalsRoad, Chetpet,Chennai 31.	1984.
2.	Vector Analysis	Dr.P.R.Vittal	Margham publications, 24, Rameswaram Road, T.nagar, Chennai– 17.	1997.
3.	Vector Analysis	T.K. Manickavasagam and others.	Vijay Nicole Imprints Pvt Ltd, # c-7 Nelson Chambers, 115, Nelson Manickam Road, Chennai – 29.	2004.

Reference Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Vector Calculus	K.Viswanathan & S. Selvaraj	Emerald Publishers, 135,Anna Salai Chennai-2.	1984.
2.	Vector Calculus	J.N. Sharma & A.R. Vasishtha	Krishna Prakasan Mandhir,9,Shivaji Road, Meerut(UP).	
3.	Vector Algebra	M.D. Raisinghania and others.	S. Chand & Co,Ltd., Ram Nagar New Delhi 110055.	1999.

First Year / Second Semester

Elective Course II – Financial Mathematics

Course code : 08UMAE02

Max Marks :75

Unit I

Probability – Probabilities and Events – Conditional probability – Random Variables and Expected Values – Convergence and correlation – Continuous Random variables – Normal Random Variables – Properties of Normal Random Variables – The central limit Theorem – Simple Problems .

Unit II

Geometric Brownian Motion – G.B.M. as a limit of simple models – Brownian Motion – Simple problems - Interest rates – Present value analysis – Rate of return – Continuation of varying interest rates – An example of option pricing – other examples of pricing via arbitrage.

Unit III

The Arbitrage theorem – The multi period Binomial model – proof of the Arbitrage theorem - Black Scholes formula – properties of the Black Scholes option cost – Derivation of Black Scholes formula – simple problems.

Unit IV

Additional results on options – Call options on Dividend paying Securities – Pricing American put options – Adding Jumps to Geometric Brownian Motion – Estimating the Volatility Parameter – Simple problems .

Unit V

Valuing by Expected Utility – Limitation of Arbitrage pricing – valuing Investments by Expected utility – The portfolio selection problem – Value at risk and conditional value at risk The capital assets pricing model – Mean variance analysis of risk – Neutral priced Call options – Rates of return – Single period and Geometric Brownian Motion – simple problems .

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	An Elementary Introduction to Mathematical Finance, 2 nd Edition	Sheldon .M.Ross	Cambridge University press	2005

Reference Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	A first course in probability	S.M.Ross	Englewood cliffs Prentice Hall-NJ	2002
2.	Options Market	J.Cox and M.Rubinstein	Englewood cliffs Prentice Hall-NJ	1985
3.	Theory of financial decision making	J.E.Ingersill	Lanjarn MD Rowerman of Little fields	1987

Second Year / Third Semester

Core Course III – Differential Equations and Laplace Transforms

Course Code : 08UMA03

Max Marks :75

Unit I

Ordinary Differential Equations – First order but not of the first degree – Equations solvable for p , x and y - Clairaut's form – Second order differential equations with constant co-efficients – Particular Integrals of the form $e^{\alpha x} V$ where V is of the form x , x^2 , $\sin ax$, $\cos ax$, $x \sin ax$ and $x \cos ax$.

Unit II

Second Order Differential equations with variable co-efficients – both homogeneous linear equations and non – linear homogeneous equations – Method of variation of parameters – simple problems.

Unit III

Partial Differential Equations – Formation of Partial Differential equations by eliminating arbitrary constants and arbitrary functions – complete, particular, singular and general integrals – solution of equations of standard types $f(p,q) = 0$, $f(x,p,q) = 0$, $f(y,p,q) = 0$, $f(z,p,q) = 0$ and $f_1(x,p) = f_2(y,q)$ – Clairaut's form – Lagrange's equation $Pp + Qq = R$.

Unit IV

Laplace Transforms – Definition – Laplace transform of standard formulae – Elementary theorems – Laplace transform of periodic functions – problems.

Unit V

Inverse Laplace Transforms – Standard formulae – Elementary theorems – Applications to second order linear differential equations – Applications to simultaneous linear differential equations – problems.

Text Books :

S.No	Name of the Book	Author	Publishing Company	Year of Publications
1	Calculus .	T.K.Manickavasagam pillai and S.Narayanan	Vijay Nicole Imprints Pvt Ltd # c-7,Nelson Chambers ,115, Nelson Manickam Road, Chennai -600029	2004
2.	Differential Equations, Fourier series and Analytical solid geometry.	Dr. P. R. Vittal	Margham Publications ,24, Rameswaram Road, T.Nager, Chennai - 600017	2000

Reference Books :

S.No	Name of the Book	Author	Publishing company	Year of Publications
1.	Ordinary & Partial differential Equations	M.D.Raisinghania	S.Chand & Co. Ltd.	1993
2.	Introduction to Partial Differential Equations	K.Sankar Rao	Prentice Hall India – New Delhi m	1997

Second year / Third semester

Core Course IV - Statics

Course Code – 08UMA04

Max Marks :75

Unit I

Introduction – Force – Definition – Parallelogram Law of forces – Triangular Law of forces – Lami's theorem problems – Like and Unlike parallel forces – Problems - Moments - definition – Varignon's theorem – Problems.

Unit II

Couples – Definition of a couple - Moment of a couple – Theorems – Problems - Three forces acting on rigid body - Coplanar forces – General conditions of equilibrium of coplanar forces acting on a rigid body - Problems.

Unit III

Introduction – Friction – Definition – Coefficient of friction – Limiting friction - Angle of friction and Cone of friction – Laws of friction – Equilibrium of a particle on a rough inclined plane under any force – Problems.

Unit IV

Definition – Centre of gravity of uniform bodies like thin rod – Thin parallelogram – Circular ring and Circular lamina – Triangular lamina - Trapezium lamina – Systems of three uniform rods forming a triangle – Method of integration for the arc of a circle – Sector of a circle – Quadrant of an ellipse – Solid and hollow sphere – Solid and hollow cone – Problems.

Unit V

Common catenary – Definition – sag and span – Intrinsic parametric Cartesian equations of a catenary – Properties – suspension bridge – Approximation to a shape of a catenary – Problems.

Text Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Mechanics	P.Duraipandian	Emerald Publishers, 135, Anna Salai, Chennai – 600002.	1984
2.	Statics	S.Narayanan	S.Chand & Co.Chennai.	1986

Reference Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Statics	Dr.M.K. Venkataraman	Agasthiar Publication, 9A, Clives Building, 33, Nandhi Koil Street, Theppakulam(post), Trichy – 620002.	1994

Second Year / Fourth semester

Core Course V - Dynamics

Course Code – 08UMA05

Max Marks :75

Unit I

Introduction – Definition – Velocity – Resultant velocity – Components of velocity and acceleration in cartesian coordinates – Tangents and Normal components of velocity and acceleration - Radial and Transverse components of velocity and acceleration – Motion of a particle along a straight line under uniform acceleration – Problems – Simple Harmonic Motion – Definition - Equations of S.H.M – Properties of S.H.M. – Composition of two S.H.Ms. – Problems.

Unit II

Introduction – Impulse and Impulsive force – Definitions – Principle of conservation of linear momentum – Newton's experimental law – Direct and oblique impact of two smooth spheres – Change in kinetic energy and impulse imparted due to collision – Impact of sphere on a fixed plane - Problems.

Unit III

Two dimensional motion of a particle – Introduction – Projectile – Trajectory - Horizontal range - Velocity of projection - Angle of projection – The path of a projectile is a parabola – Range and time of flight on a horizontal plane –Range and time of flight on an inclined plane – Problems.

Unit IV

Definition – Central force – Central orbit - Areal velocity – Differential equation of the central orbit in polar co-ordinates – p-r equation of the central orbit – Given the central orbit to find the law of force – Given the law of central force to find the orbit - Problems.

Unit V

Moment of Inertia of simple bodies – Parallel and Perpendicular axes theorems – Motion of a rigid body about a fixed horizontal axis – Kinetic Energy of rotation – Moment of momentum – Period of oscillation of a compound pendulum – Simple equivalent Pendulum – Interchangeability of centre of suspension and centre of oscillation – Problems.

Text Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Mechanics	P.Duraipandian	Emerald Publishers, 135, Anna Salai, Chennai – 600002.	1988
2.	Dynamics	S.Narayanan	S.Chand & Co.Chennai.	1986

Reference Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Dynamics	Dr.M.K. Venkataraman	Agasthiar Publication, 9A, Clives Building, 33, Nandhi Koil Street, Theppakulam(post), Trichy – 620002.	1994

Second Year / Fourth semester

Skill Based Elective Course II – Aptitude Examination - II

Course Code : 08UMAS02

Max Marks :75

Unit I

Chain rule –Time and work.

Unit II

Time and Distance .

Unit III

Problems on Trains.

Unit IV

Boats and Streams.

Unit V

Alligation or Mixture.

Text Books :

S.No	Name of The Book.	Author	Publishing company	Year of Publication
1.	Quantitative Aptitude For Competitative Examinations.	R.S.Aggarwal	S.Chand and co Ltd,152,Annasalai,Chennai.	2001

Second Year / Fourth Semester

Skill Based Elective Course III – Aptitude Examination – III

Course code : 08UMAS03

Max Marks :75

Unit I

Simple Interest.

Unit II

Compound Interest.

Unit III

Logarithms – Races And Games Of Skill.

Unit IV

Area.

Unit V

Volume and Surface Areas.

Text Book :

S.No	Name of the Book	Author	Publishing company	Year of Publication
1.	Quantitative Aptitude for competitive Examinations	R.S.Aggarwal	S.Chand and Co Ltd,152 ,Annasalai, Chennai.	2001

Third Year / Fifth semester

Core course VI – Algebraic Structures

Course code : 08UMA06

Max Marks :75

Unit I

Group – Definition – Examples – Addition Modulo n – Multiplication Modulo n – Symmetric Group – Some Preliminary lemmas – problems - Order of an element – properties. (sections 2.1 – 2.3).

Unit II

Cyclic Groups – Sub Groups – Definition – Examples – Properties – Coset – Lagrange's Theorem - Normal sub groups - Quotient groups – properties – problems (sections 2.4 – 2.6).

Unit III

Homomorphism – Definition – Examples - Lemmas - Kernel of a homomorphism – Fundamental theorem – Automorphism – Definition – Inner Automorphism – Lemmas – Examples – Cayley's Theorem. (Sections 2.7 – 2.9 excluding application 1 & 2).

Unit IV

Ring – Definition – Examples – some special classes of Rings – Zero Divisor – Integral Domain - Field - Definition – Examples-Ideals – Quotient Rings – Maximal ideal.(sections 3.1 , 3.2 , 3.4 & 3.5).

Unit V

The Field of Quotient of an Integral Domain – Euclidean Rings – Definition – Principal ideal Ring – Greatest common divisor – Properties – Unique factorization theorem (sections 3.6 & 3.7).

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Topics in Algebra	I.N.Herstein.	John Wiely, Newyork.	1975

Reference Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	A first course in modern algebra	A.R.Vasistha	Krishna Prekasen Mandhir, 9, Shivaji Road, Meerut(UP)	1983
2.	Modern Algebra	M.L.Santiago	Tata McGraw Hill ,New Delhi.	1994
3.	Modern Algebra	K.Viswanatha Naik	Emerald Publishers, 135, Anna Salai, Chennai.	1988
4.	A text Book of Modern Algebra	Dr.R.Balakrishnan and Dr.N.Ramabadran	Vikas Publishing House, NewDelhi	1994

Third Year / Fifth Semester

Core Course :VII - Sequences And Series

Course code : 08UMA07

Max Marks :75

Unit I

Definition – Sequence and subsequence – Limit of a sequence – Convergent sequence – Divergent of sequences – Bounded sequences – Monotone sequences – Operations on convergent sequences(Section 2.1 - 2.7).

Unit II

Operations on divergent sequences – Limit superior and Limit Inferior – Cauchy sequences – Convergence and Divergence of series – Series with nonnegative terms – Alternating series – Conditional convergence – Absolute convergence. (Section 2.8 – 2.10 & 3.1 - 3.4).

Unit III

Rearrangement of series – Tests for absolute convergence – Series whose terms form a nonincreasing sequence – Summation by parts (section 3.4 – 3.8).

Unit IV

Vandermonde's Theorem - Binomial theorem for rational index with proof – Summation and approximation (section 4,5,10,14).

Unit V

Exponential and Logarithmic series with proof – Summation of series using the above two theorems and approximation.(section 1 - 11).

Text Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Methods of Real Analysis	Richard R. Goldberg .	Oxford &IBH Publishing Co.Pvt.Ltd.	1970
2.	Algebra –Vol . I	T.K.Manickava sagam Pillai, Natarajan &Ganapathy		

Reference Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Mathematical Analysis.	Tom .M. Apostel	Narosa Publications ,New Delhi	2002

Third Year / Fifth Semester

Core Course :VIII – Discrete Mathematics

Course Code : 08UMA08

Max Marks :75

Unit I

Mathematical Logic – Statements and Notations – Connectives – Negation - conjunction – Disjunction-Statement Formulas and Truth Table – Conditional and Biconditional – Well formed Formulas – Tautologies.(sections 1.1 , 1.2.1 – 1.2.4 , 1.2.6 –1.2.8).

Unit II

Normal Forms – Disjunctive Normal Forms – Conjunctive Normal Forms - Principal Disjunctive Normal Forms – Principal Conjunctive Normal Forms - Ordering and Uniqueness of Normal Forms – The Theory of Inference for the Statement Calculus – Validity using Truth tables - Rules of Inference - Consistency of premises and indirect method of proof .(sections 1.3.1 - 1.3.5 , 1.4.1 – 1.4.3).

Unit III

Relations & ordering – Relations – Properties of binary relation in a set - Functions – Definition & Introduction – Composition of Functions – Inverse function – Binary and n - array operations – Hashing Functions – Natural numbers – Peano Axioms & Mathematical Induction – Cardinality .

Unit IV

Algebraic systems – Definition & Examples – Semi groups and monoids – definition and examples – homomorphism of semi groups & monoids – sub semi groups & sub monoids – Grammars – Formal Definition of a Language – Notions of Syntax Analysis. (sections 3.1.1 , 3.1.2 , 3.2.1 , 3.2.2 , 3.2.3 , 3.3 , 3.3.2 , 3.3.3).

Unit V

Lattices as partially ordered Sets: Definition and Examples – some properties of Lattices – Lattices as Algebraic systems – sub Lattices – Direct product and homomorphism.

Boolean Algebra: Definition and Examples – subalgebra , Direct product and homomorphism – Boolean Functions – Boolean Forms and Free Boolean Algebras - Values of Boolean Expression and Boolean Functions (sections 4.1.1 , 4.1.2 , 4.1.3 , 4.1.4 , 4.2.1 , 4.2.2 , 4.3.1 , 4.3.2).

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Discrete mathematical structures with applications to computer science	J.P.Trembly, R.Manohar	Tata Mc Graw Hill, NewDelhi	2001

Reference Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Discrete Mathematics	Prof.V.Sundaresan, K.S.Ganapathy Subramaniyan, K.Ganesan	Tata Mc Graw Hill, NewDelhi	2000
2.	Discrete Mathematics	L.Lovarz, J.Pelikan, K.Vexztergombi	Springer International Edition	2002

Third Year / Fifth semester

Core Course :IX - Numerical Analysis

Course code : 08UMA09

Max Marks :75

Unit I

Method of successive approximation – The method of false position - Newton Raphson Method – Generalized Newton's Method – Muller's Method.

Unit II

Finite Differences – Forward Differences – Backward Differences – Symbolic relations and separation of symbols – Detection of Errors by use of difference tables – Differences of a polynomial – Newton's formulae for Interpolation – Central Difference Interpolation formulae – Gauss's central difference formulae – Stirling's formulae – Bessel's formulae – Everett's formulae.

Unit III

Numerical Differentiation – Errors in Numerical Differentiation – Numerical Integration - Trapezoidal rule – Simpson's 1/3 rule – Simpson's 3/8 rule – Boole's and Weddle's rule.

Unit IV

Solution of Linear systems – Direct Methods – Matrix Inversion method – Gaussian elimination method – Modification of the Gauss method to compute the inverse – Method of Factorization – Solution of Linear systems – Iterative methods – Jacobian's method – Gauss - Seidal Method.

Unit V

Solution of Taylor's series – Picard's method of successive approximations – Euler's method – Runge – Kutta methods – II order and III order.

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Introductory Methods of numerical analysis	S.S.Sastry	Prentice Hall of India Pvt Ltd, New Delhi	2000

Reference Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Numerical Methods	E.Balagurusamy	Tata Mc Graw Hill Publishing Company Ltd, NewDelhi	2002
2.	Engineering Numerical Methods	T.K.Manickavasagam and Narayanan	S.Viswanathan & Co, Chennai	1998

Third Year / Fifth semester

Elective Course III – Linear Programming

Course Code : 08UMAE03

Max Marks :75

Unit I

Introduction - Definition of O.R. – Scope , phases and Limitations of O.R. – Linear Programming Problem – Definitions – Mathematical Formulation – Characteristic of a LPP – Matrix form of LPP – Graphical Method – Definitions of bounded , unbounded and optimal solutions – procedure of solving LPP by graphical method – problems – Simplex technique - Definitions of Basic , nonbasic variables – basic solutions – slack variables and optimal solution , simplex procedure of solving LPP – problems.

Unit II

Introduction – Big – M method – Definitions of Big – M method , surplus variables and artificial variables – Procedure of solving an LPP by Big – M method – Pseudo optimal solution – Problems – Two – Phase Simplex method – Procedure of solving an LPP by two – phase simplex method – problems.

Unit III

Introduction – Balanced and unbalanced T.P , Feasible solution – Basic feasible solution – Optimum solution – Degeneracy in a T.P. – Mathematical formulation – North – West Corner rule – Vogell's approximation method (unit penalty method) - Method of Matrix minima (Least cost Method) – problems – Algorithm of Optimality test (Modi Method) – Problems .

Unit IV

Assignment problem – Definition – Mathematical formulation of the Assignment problem – Test for optimality by using Hungarian method - Unbalanced Assignment problem – Degeneracy in Assignment problem - Maximization case in Assignment problem – Restrictions on Assignment problem – Variations in Assignment problem – problems .

Unit V

Introduction – Definition – Basic assumptions – n jobs to be operated on two machines – problems – n jobs to be operated on three machines – problems – n jobs to be operated on m machines – problems – Two jobs to be operated on 'm' machines (graphical method) – problems.

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Operations Research, Ninth Edition	P.K.Gupta, Man Mohan and Kanti Swarup	Sultan Chand and Sons, New Delhi	2001

Reference Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Operations Research, Second Edition	S.Kalavathy	Vikas Publishing House, New Delhi	2002
2.	Operations Research, Second Edition	P.K.Gupta and D.S.Hira	S.Chand & Co, NewDelhi	2004
3.	Operations Research	Hamdy Taha	Prentice Hall Publications, NewDelhi	1996

Third Year / Fifth Semester

Elective Course:IV – Number theory

Course Code : 08UMAE04

Max Marks :75

Unit I

The Division Algorithm – The g.c.d. – The Euclidean Algorithm – The Diophantine Equation $ax + by = c$.

Unit II

The Fundamental theorem of arithmetic , The sieve of Eratosthenes – The Goldbach conjecture – basic properties of congruence.

Unit III

Special Divisibility tests – Linear congruences – The Little Fermat's theorem – Wilson's theorem.

Unit IV

The functions ϕ – The Mobius inversion formula – The greatest integer function.

Unit V

Euler's ϕ – function – Euler's theorem – Some properties of the ϕ – function.

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Elementary Number Theory	David M. Burton	Universal Book Stall	2001

Reference Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Number Theory	Kumaravelu and Suseela Kumaravelu	S.Kumaravelu, Muruga Bhavanam, Chidambara Nagar, Nagarkoil-2.	2002

Third Year / Fifth Semester

Elective Course V - Combinatorics

Course Code : 08UMAE05

Max Marks :75

Unit I

Introduction to Basic ideas – General formula for $f(n,k)$ – Recurrence Relation – boundary condition - Fibonacci sequence – generating function .

Unit II

Permutation – Ordered selection – unordered selection – further remarks on Binomial theorem.

Unit III

Pairing within a set – Pairing between set and optimal assignment problem – Gale's optimal assignment problem.

Unit IV

Fibonacci type relation – using generating function – Miscellaneous method – counting simple electrical networks .

Unit V

The inclusion – Exclusion principle - Rook polynomial.

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	A First Course in Combinatorial Mathematics	Jan Anderson	Oxford Applied Mathematics and Computing Science Series, UK	1974
2.	Combinatorics	V.K.Balakrishnan	Schum Series	1996

Third Year / Fifth Semester

Skill Based Elective Course IV – Aptitude Examination – IV

Course code : 08UMAS04

Max Marks :75

Unit I

Calender and Clocks.

Unit II

Stocks and Shares.

Unit III

Permutations and Combinations - Probability.

Unit IV

True Discount and Banker's Discount.

Unit V

Heights and Distances – Odd Man Out and Series.

Text Book :

S.No	Name of the Book	Author	Publishing Company	Year of Publications
1.	Quantitative Aptitude for Competitive Examinations	R.S.Aggarwal	S.Chand Co Ltd,152,Annasalai,Chennai.	2001

Skill Based Elective Course V – MATLAB

Course Code : 08UMAS05

Max Marks :75

Unit I

A simple Mathematical Model – Conservation laws in Engineering and Science – Numerical Methods Coverd in this Book (Chapter I –Full).

Unit II

The MATLAB Environment – Assignment – Mathematical operations – Use of Built - in Functions – Graphics – Other Resources – Case study – Exploratory Data Analysis.

(Chapter II – Full)

Unit III

M – Files – Input – Output – Structured Programming – Nesting and Indentation (Chapter III –section 3.1 - 3.4).

Unit IV

Passing Functions To M – Files – Case Study :Bungee Jumper Velocity (Chapter 3 – Section 3.5 – 3.6

Unit V

Errors 80 – Round Off Errors – Truncation Errors – Total Numerical Error – Blunders – Model Errors – Data Uncertainty (Chapter IV – Full).

Text Books:

S. NO	Title of the Book	Author	Publishing company	Year of Publication
1	Applied Numerical Methods with MATLAB for Engineers And Scientists	Steven C. Chapra	TATA Mc Graw –Hill Publishing company Ltd.	2007

Reference Books :

S.No.	Title Of The Book	Author	Publishing company	Year Of Publication
1.	Technical Analysis and applications with Matlab	Stanley	Printed and bounded in India by Barkha Nath Printers ,Delhi	I Indian Reprint 2007
2	Aguide to Matlab For Beginnners and Experienced users	Brian –R.Hunt,Ronald I.Lipsman ,Jonathan.m.Rosenberg	Printed in India at Raplika press Pvt Ltd, Kundly,Cambridge University press.	Reprint 2005

Third Year / Sixth Semester

Core Course X – Linear Algebra

Course Code : 08UMA10

Max Marks :75

Unit I

Vector Spaces – Definition – Simple properties – Examples – Homomorphism – Sub space – Quotient spaces – Internal direct sum – External direct sum.(Section 4.1).

Unit II

Linear Independence – Dimension of a Vector space – Bases - Dimension of Quotient spaces (Section 4.2).

Unit III

Inner product spaces – Definition – Examples – Applications – Orthogonal complement of a sub space – Orthonormal & Orthonormal Basis - Gram Schmidt Orthogonalization process (Section 4.4) .

Unit IV

Linear Transformation – The Algebra of linear transformations - Characteristic roots – Matrices – Canonical forms – Triangular forms(section 6.1 - 6.4)

Unit V

Nilpotent Transformations – Definitions – Lemma – Theorems Trace and Transpose – Definition – Properties – Theorems.

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Topics in Algebra- 2 nd Edition	I.N.Herstein	John Wiely, NewYork	1975

Reference Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	A first course in modern algebra	A.R.Vasistha	Krishna Prakasan Mandhir, 9, Shivaji Road, Meerut (UP)	1983
2.	Modern Algebra	Viswanatha Naik	Emerald Publishers, 135, Anna Salai, Chennai –2.	2001
3.	A Text Book of Modern Algebra	Dr.R.Balakrishnan and Dr.N.Ramabadran	Vikas Publishing Limited, NewDelhi	1984

Third Year / Sixth semester

Core course : XI – Real Analysis

Course Code : 08UMA11

Max Marks :75

Unit I

Sets and Elements –Operations on sets -Function – Real valued function – Equivalence – Countability – Real numbers –Least upper bounds.(section 1.3 –1.7).

Unit II

Function – Continuous at a point on the real line – Reformation – Functions continuous on a metric space – Open sets – Closed sets – Discontinuous function on real line (Section 5.1 – 5.6).

Unit III

More about open sets – Connectd sets – Bounded sets and Totally bounded sets – Complete metric spaces – Compact metric spaces – Continuous functions on Compact spaces – Continuity of the inverse function.(Section 6.1 – 6.7).

Unit IV

Uniform continuity – Sets of measure zero – Definition of the Riemann integral – Existence of the Riemann integral – Properties of the Riemann integral. (Section 6.8 & 7.1 - 7.4).

Unit V

Derivatives - Rolle's theorem – The law of the mean – Fundamental theorems of calculus (Section 7.5 – 7.8).

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Methods of Real Analysis.	Richard R. Goldberg.	IBM Publishing New Delhi.	1970.

Reference Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	A First course in Real Analysis .	Sterling K .Barberian.	Springer (India) Private Limited, New Delhi.	2004
2.	Mathematical Analysis	Tom M. Apostel	Narosa Publications, NewDelhi	2002
3.	Real Analysis	M.S.Rangachari	New Cuntury Book House, chennai.	1996

Third Year / Sixth Semester

Core Course XII – Complex Analysis

Course Code : 08UMA12

Max Marks :75

Unit I

Functions of a complex variable – Limit of a function at a point – Theorems on limits – continuity – Derivatives – Cauchy – Riemann equations – Necessary and sufficient conditions – Analytic function – Examples - Harmonic Function – Properties – To find an analytic function whose real and imaginary part is given.- problems.

Unit II

Bilinear transformations - Definition - Properties – Invariance of cross ratio – Fixed points – problems – Special bilinear transformations - problems.

Unit III

Simply connected domain – Cauchy's fundamental theorem – proof using Goursat's lemma – Cauchy's theorem for multiply connected domains – Cauchy's integral formula & Cauchy's formula for the first derivative – Morera's theorem - problems.

Unit IV

Cauchy's Inequality – Liouville's theorem - Fundamental Theorem of Algebra – Maximum modulus theorem – Taylor's series – Laurent's series – problems .

Unit V

Singularities – Types of singularities – Isolated singularity – Removable Singularity - Pole - Essential singularity – Determination of the nature of singularity – Residue –Definition – Calculation of residues – Cauchy's residue theorem – Contour Integration - Integration around unit circle - Integration along the real axis – Jordan lemma (statement only) - Integration of functions with poles on the real axis - Problems.

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Complex Variables and Applications	Ruel V Churchill	Mc Graw Hill International Book Company, Newyork.	1986
2.	Complex Analysis	P.Duraipandian & Laxmi Duraipandian, D.Muhilan	Emerald Publishers, 135, Anna Salai, Chennai – 600 002	1988

Reference Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Theory and Problems of complex analysis	Murray	Schuam Outline Series	1986
2.	Functions of a complex Variable	B.S.Tyagi	Krishna Prakasan Mandhir, 9, Shivaji Road, Meerut (UP)	1985
3.	Functions of a complex Variable	J.N.Sharma	Krishna Prakasan Mandhir, 9, Shivaji Road, Meerut (UP)	1985
4.	Functions of a complex Variable	M.L.Khanna	Jai Prakash Nath, Meerut (UP)	1986

Third Year / Sixth Semester

Core Course XIII – Graph theory

Course code : 08UMA13

Max Marks :75

Unit I

Introduction – Definition – Examples – Degrees – Definition – Theorem 1 and corollary – Theorem 2 and problems – subgraphs – definitions – Theorem – 1 - Operations on Graphs - definition – Theorem - 1 – problems.

Unit II

Introduction – Walks , Trails and paths – Definitions - Theorem – 1,2,3 - Connectedness and components – Definitions – Theorem – 1,2,3 - Definition – Distance – Theorem 1 – Definitions – Cut , Point , Bridge – Theorem 1,2,3,4 – Blocks – Definition – Theorem 1 – Connectivity – Definition – Theorem 1 - Definition.

Unit III

Introduction – Eulerian Graphs - definition – Lemmas 1 – Theorem – 1 - Koningsberg Bridge Problem – Corollary I and II – Definition – Theorem - Fleury's Algorithm – Hamiltonian Graphs – Definitions – Theorem 1,2,3 – Lemma – Definition (closure) - Theorem 1,2 – corollary – Theorem.

Unit IV

Introduction – Characterization of Trees – Theorem I – Corollary – Theorem 2 with corollary – Theorem 3 – Center of a Tree – Definition – Theorem.

Unit V

Introduction – Definition Basic Properties – Definitions – Theorem 1 - Definitions – Theorem 2 - Definitions – Paths and connections – Definition - Theorem 1 - Definitions – Theorem 2 – Digraphs and Matrices – Definition– Theorem 1-Definition – Theorem 2 – Definition – Theorem 3 .

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Invitation to Graph Theory	S.Arumugam, S.Ramachandran	Scitech Publications,Chennai	2001

Reference Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Basics of Graph Theory	K.R.Parthasarathy	TMH Publishing company	2001
2.	Graph theory	S.Kumaravelu and suseela kumaravelu	SKV Printers	1996
3.	A first course in Graph theory	A.Chandran	Macmillan Publishers, Chennai	1997

Elective Course VI : Operations Research

Course Code : 08UMAE06

Max Marks : 75

Unit - I

Introduction – Definition of Inventory models – Type of inventory models -

- (i) Uniform Rate of Demand, infinite rate of production and no shortages.
- (ii) Uniform Rate of Demand, finite rate of replacement and no shortages.
- (iii) Uniform Rate of Demand instantaneous production with shortage - Book Works - problems.

Unit - II

Definitions - Newspaper boy problem - Discrete and continuous type cases – problems – Inventory model with one and two price break – problems.

Unit III

Introduction - Definition of steady state, transient state and queue discipline, characteristics of a queuing model – Applications of queuing model – Little's formula – classification of queues – Poisson process – Properties of Poisson process.

Models

- (i) (M / M / I) : (∞ / FCFS)
- (ii) (M / M / I) : (N / FCFS)
- (iii) (M / M / S) : (∞ / FCFS) – Problems.

Unit IV

Introduction – Definition of network, event, activity, optimistic time, pessimistic time, the most likely time, critical path, total float and free float – Difference between slack and float – Phases of critical path in a PERT network – difference between CPM and PERT – Problems.

Unit V

Definition of project, direct and indirect cost, crashing and crashing cost, cost slope – crash duration – Time cost optimization algorithm – Resource allocation and scheduling – Problems.

Text Books :

S.No	Name of the Book	Author	Publishing Company	Year Of Publication
1.	Operations Research 9 th Edition	P.K.Gupta ,Manmohan and Kanti Swarup	Sultan Chand & Sons,Chennai.	2001

Reference Books :

S.No	Name of the Book	Author	Publishing Company	Year Of Publication
1.	Operations Research 2 nd Edition	S.Kalavathy	Publisging House Pvt Ltd,New Delhi	2002
2.	Operations Research 2 nd Edition	P.K.Gupta and D.S.Hira	S.Chand &Co ,New Delhi.	1986
3.	Operations Research	Hamdy Taha	Prentice Hall India ,NewDelhi .	2002

Third Year / Sixth Semester

Elective Course VII – Astronomy

Course Code : 08UMAE07

Max Marks : 75

Unit I

Standard formulae in Spherical Trigonometry – Statements only – Celestial sphere – Celestial co-ordinates and their conversions – Diurnal motion - Problems connected with Diurnal Motion - Zones of Earth - Dip – Twilight – Problems.

Unit II

Astronomical Refraction – Tangent and Cassini's formulae – Geo – centric parallax – Helio - centric parallax – problems.

Unit III

Kepler's laws of planetary motion – Newton's deductions from Kepler's Laws - Equation of Time – Seasons – Calender – Conversion of time – problems.

Unit IV

Fixing the Ecliptic – Fixing the position of the First point of Aries (Flamsteed's method) - The Moon – Different phases - Metonic cycle – Tides – problems .

Unit V

Eclipses – solar eclipses - Lunar eclipses – General description of solar system and Stellar universe – problems.

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Astronomy	Kumaravelu and Susila Kumaravelu	S.Kumaravelu, Muruga Bhavanam, Chidambara Nagar, Nagarkoil-2.	1984

Third Year / Sixth Semester

Elective Course VIII – Probability Theory

Course Code : 08UMAE08

Max Marks:75

Unit – I

Introduction – probability Axioms – conditional probability – Baye's theorem – independent events – problems.

Unit II

Random variable – probability distribution of a random variable – Discrete and continuous variables – problems .

Unit – III

Expected value – Functions of a random variable – Moment generating functions – problems .

Unit – IV

Two point distribution – Binomial distribution – Poisson distribution – Gamma distribution – Normal distribution – Chebychev's inequality – problems.

Unit – V

Regression model – one way analysis of variance – Two way analysis of variance – problems.

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	An Introduction to Probability Theory and Mathematical Statistics	V.K.Rokatgi	Wiely Eastern Publications, NewDelhi	1985

Reference Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Probability theory and Mathematical Statistics	Marek Fiseh	John wiely and sons, NewYork	1956

Third Year / Sixth Semester

Skill Based Elective Course VI – CHILAB

Course Code : 08UMAS06

Max Marks :75

Unit I

Introduction – Learning Scilab – Further References – Starting Scilab – Typing Commands.

Unit II

Simple calculations : Basic Arithmetic – Complex Numbers.
Help in Scilab : The Help Command – The Help Window – Help on the Web.

Unit III

Adding a Line – Hints for Good Graphs – Plot data as points – Choose a good scale.

Unit IV

Solving Equations - Matrices and Vectors – Creating Matrices – Systems of Equations – Polynomials.

Unit V

Graphs – Function Plotting – Component Arithmetic – Printing Graphs – Graphs in Reports – Advanced Graphics.

Text Book :

S.No	Name of the Book	Author	Publishing Company	Year Of Publication
1.	Introduction to Scilab	Graeme Chandler, Stephen Roberts	-	August 7, 2002

Allied Mathematics

**(For B.Sc. Physics , Chemistry, Computer Science , Electronics and B.C.A
Major Students admitted from the year 2008 - 2009 onwards)**

First Semester / Third Semester

Course I - Algebra and Differential Calculus

Course Code – 08UMAA01

Max Marks:- 75

Unit I

Characteristic Equation - Eigen values and Eigen Vectors - Cayley Hamilton Theorem (Statement only) and its Problems - Rank of a Matrix - Problems.

Unit II

Polynomial Equations - Imaginary and Irrational Roots - Relation between Roots and Coefficients - Transformation of Equations - Descarte's rule of signs - Problems.

Unit III

Successive Differentiation - nth Derivative - Leibnitz formula for nth Derivative - Problems.

Unit IV

Partial Differtiation - Partial Derivative of Higher orders - Homogeneous Functions - Problems.

Unit V

Radius of Curvature in Cartesian and Polar Coordinates - Pedal Equation of a curve - Radius of Curvature in p - r Coordinates.

Text Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Algebra Volume-I	T.K.Manickava sagam Pillai and S.Narayanan.	Vijay Nicole Imprints Pvt Ltd, # C-7 Nelson Chmbers. 115,Nelson Manickam Road, Chennai – 600029.	2004
2.	Algebra Calculus and Trigonometry	Dr.P.R.Vittal .	Margham Publications, 24, Rameswaram Road , T.Nager, Chennai - 600017.	2000

Reference Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Calculus	N.P. Bali	Krishna Prakasan Mandhir, 9, Shivaji Road, Meerut (UP).	1994.
2.	Calculus	D. Sudha	Emerald Publishers, 135, Anna Salai, Chennai – 600002.	1988

Allied Mathematics

**(For B.Sc. Physics Chemistry , Computer science , Electronics and B.C.A.
Major students admitted from the year 2008 - 2009 onwards)**

First / Third Semester and Second / Fourth Semester

Course II - Integral Calculus , Fourier series and Vector calculus.

Unit I ,Unit II - First / Third Semester - 2Hours / Week

Unit III , Unit IV , UnitV – Second / Fourth Semester - 2 Hours / Week

Course code :08UMAA02

Max Marks:75

Unit I

Integral Calculus - Integration by parts – Definite integrals and its properties - Reduction formulae for $\int_0^{J/2} \sin^n x \, dx$, $\int_0^{n/2} \cos^n x \, dx$, $\int_0^{n/4} \tan^n x \, dx$, $\int \cot^n x \, dx$, $\int_0^a x^n e^{ax} \, dx$, $\int_0^a e^{-x} x^n \, dx$ - problems.

Unit II

Fourier series: Definition – To find the Fourier coefficients of periodic functions of period $2J$ - even and odd functions - Half range series problems.

Unit III

Vector differentiation: Limit of a vector function – derivative of vector function - Definition of Gradient of a scalar point function - Directional derivative of a scalar point function – problems.

Unit IV

Vector point function: Divergence and curl of a vector point function – solenoidal and irrotational functions – Vector identities - Laplacian operator.

Unit V

Line integrals – surface integrals and volume integrals – Gauss's Divergence theorem – stoke's theorem – Green's theorem – (statement only) – problems.

Note : The University Examination will be conducted at the end of even semester.

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Allied Mathematics	T.K.Manickavasagam Pillai and S.Narayanan.	S.Viswanathan and Co., Chennai	1992
2.	Allied Mathematics	Dr.P.R.Vittal .	Margham Publications, 24, Rameswaram Road , T.Nager, Chennai - 600017.	2002
3.	Allied Mathematics	A.Singaravelu	Meenakshi Traders, Chennai	2002

Reference Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Vector Calculus	K.Viswanathan and S.Selvaraj	Emerald Publishers, 135,Anna Salai,Chennai – 600002.	1984.
2.	Calculus	N.P.Bali.	Krishna Prakasam Mandir,9,Shivaji road,Meerut(UP).	1994

Allied Mathematics

**(For B.Sc. Physics, Chemistry, Computer Science , Electronics and B.C.A.
Major students admitted from the year 2008-2009 onwards)**

Second / Fourth Semester

Course III : Differential equations and Laplace Transforms

Course Code – 08UMAA03

Max Marks:75

Unit I

Second order differential equation with constant coefficient - particular integral of the type e^{ax} , $\cos ax$ or $\sin ax$, x^n , $e^{ax} V$ where V is any function of $\cos ax$ or $\sin ax$ or x or x^2 or $x \sin ax$ or $x \cos ax$.

Unit II

Formation of Partial differential Equation by eliminating arbitrary constants and arbitrary functions – Definitions – Complete, particular, singular and general integrals - problems.

Unit III

Solutions of standard types of Partial differential equations - Clairaut's Form – Lagrange's linear Partial Differential Equations $Pp + Qq = R$ - problems.

Unit IV

Laplace transforms – Definition - Standard formula – Elementary theorems - problems.

Unit V

Inverse Laplace transforms – Standard formula – Elementary theorems – Applications to solving second order differential equations with constant coefficients – problems.

Text Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Differential Equations and Laplace Transforms	Dr.P.R.Vittal	Margham Publications, Chennai -600017.	2002
2.	Allied Mathematics	Dr.P.R.Vittal .	Margham Publications, 24, Rameswaram Road , T.Nager, Chennai - 600017.	2002
3.	Allied Mathematics	A.Singaravelu	Meenaksh Publicshers,120,Pushpa Nagar, Medavakkam, Chennai – 601302.	2002

Reference Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Engineering Mathematics	Gunavathi & Thilkavathy	Emerald Publishers, 135,Anna Salai,Chennai – 600002.	1984.
2.	Calculus	N.P.Bali.	Krishna Prakasam Mandir,9,Shivaji road,Meerut(UP).	1994

Allied I – Numerical Methods

**(For Mathematics Computer Applications Students
admitted from the year 2008 - 2009 onwards)**

First Year / First Semester

Course I - Numerical Methods

Course Code – 08UMAA07

Max Marks: 75

Unit I

Solution of algebraic and transcendental Equations – Iteration method – bisection method - Newton Raphson method - Method of false position – Generalised Newtons method for multiple roots – problems.

Unit II

Finite differences - Forward differences – Backward differences – central differences - Differences of a polynomial.

Unit III

Operators – Forward difference operator - Backward difference operator – central difference operator - Averaging operator - properties of operators Δ and E - Relation between the operators.

Unit IV

Interpolation – Newton's forward interpolation formula - Newton's Backward interpolation formula – Central difference interpolation formula – Gauss's forward interpolation formula – Gauss's backward interpolation formula – Bessels's Formula – stirling's Formula – Problems.

Unit V

Interpolation with unequal intervals - Lagrange's interpolation formula - Divided differences – Newton's divided difference formula – Hermite's interpolation formula problems.

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publishing
1.	Introductory Methods of Numerical Analysis – 4 th Edition.	S.S. Sastry.	Prentice – Hall of India Pvt,Ltd.,New Delhi	2005
2.	Numerical Methods in Science and Engineering – 2 nd Edition(Revised).	Dr. M.K. Venkataraman	The National Publishing Company Madras.	

Reference Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publishing
1.	Numerical Methods. (Fourth Edition).	A.Singaravelu.	Meenakshi Company, 120 , Pushpa Nagar, Medavakkam, Chennai 601302.	1999
2.	Numerical Methods.	E.Balagurusamy.	Tata Mcgraw Hill Co, New Delhi.	1999
3.	Numerical Methods in Science and Engineering and Science – 2 nd Edition(Reprint).	Dr. B.S.Grewal	Khanna Publishers 2-B. Nath Market, Nai Sarak, Delhi – 110006.	2003.

Allied I – Numerical Methods.

First year - Second Semester

**(For B.Sc. Computer applications students admitted
from the year 2008 - 2009 onwards)**

Course II – Numerical Calculus

Course Code - 08UMAA08

Max Marks:75

Unit I

Numerical differentiation - Newton's Forward difference formula to compute the derivatives - Newton's Backward difference formula to compute the derivatives – derivatives using Stirling's formula - Bessel's formula – problems.

Unit II

Numerical Integration - Trapezoidal rule – Simpson's one – third rule – Simpson's three – eighth rule - Boole's rule - Weddle's rule - Euler – Maclaurin formula - Gaussian integration – problems.

Unit III

Difference Equations - Definition - Formation of difference Equations - linear difference Equations - linear difference equations with constant coefficients - rules for finding the complementary function and particular integral - difference equations reducible to linear form – problems.

Unit IV

Solution of linear simultaneous equations - Direct method - Matrix inversion method - Gauss elimination method - Gauss – Jordan method – Jacobi's iteration method - Gauss – Seidel iteration method – problems.

Unit V

Numerical solution of ordinary differential Equations - Picard's method of successive approximations - Taylor's series method - Euler's method - Modified Euler's method - Runge - Kutta method of second order - problems .

Text Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Introductory methods of Numerical Analysis – 2 nd Edition.	S.S. Sastry.	Prentice – Hall of India Pvt. Ltd, New Delhi.	1990.
2.	Numerical Methods in Science and Engineering – 2 nd Edition(Revised).	Dr.M.K. Venkataraman.	The National Publishing Company, Madras.	

Reference Books :-

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Numerical Methods (Fourth Edition).	A. Singaravelu.	Meenakshi Company 120, Pushpa Nagar, Medavakkam, Chennai – 601302.	1999.
2.	Numerical Methods	E.Balagurusamy	Tata. Megraw Hill Co, New Delhi.	1999.
3.	Numerical Methods in Engineering and (Second Reprint)	Dr. B.S. Grewal	Khanna Publishers,2 – B, Nath Market, Nai sarak, Delhi- 110006.	2003.

Allied I – Numerical Methods – List of Practicals

**(For B.Sc. Mathematics Computer Applications Major
students admitted from the year 2008 - 2009 onwards)**

Course code : 08UMAAP01

Max Marks : 75

1. Solutions of Algebraic and Transcendental Equations - Bisection method method of successive approximation – The method of false position – Newton – Raphson method – Generalized Newton's Method.
2. Interpolation – Newton's Gregory formula for forward and backward difference – Bessel's formula and Stirling's formula – Newton's divided Difference formula and Lagrange's formula.
3. Numerical differentiation - Newton's Gregory formula for forward and backward difference - Bessel's formula and Stirling 's formula.
- 4 .Numerical Intergration – Trapezoidal rule- Simpson's one – third rule and Simpson's three – eighth rule – Boole's and Weddle's rule – Euler Maclaurin's formula- Gaussian integration.
- 5 .Numerical solution – Matrix inversion method – Gaussian elimination method – Jacobi method of iteration – Gauss - Siedal method of iteration –solution by Taylor's series – Picard's method of successive approximations –Euler's method -Modified Euler's method - Runge – Kutta second order method.

Allied I - Mathematics

(For B.Sc. Statistics Major students admitted from the year 2008-2009 onwards)

Course I - Mathematics

First Year / First semester.

Course code : 08UMAA04

Max Marks :75

Unit I

Rank of a Matrix – definition – Rank of a Matrix - problems - condition for consistency – solution to a system of nonhomogeneous equation - orthogonal and unitary matrices - problems .

Unit II

Differential calculus – Jacobians - Condition for maxima and minima
Of functions of two variables - problems – Lagrange's multipliers - simple problems.

Unit III

Integration by parts – Bernoulli's formula – Definite integral – Simple properties and problems - Double integral – simple problems.

Unit IV

Sequences of real numbers - Definition of sequence and subsequence - Limit of a sequence – Convergent sequences – Divergent sequences – Bounded sequences – monotone sequences - Operations on convergent sequences – Operations on divergent sequences – Limit superior and Limit inferior – Cauchy sequences.

Unit V

Series of real numbers – Convergence and divergence – Series with nonnegative terms – Alternating series - Conditional convergence and absolute convergence – Rearrangement of series – Tests for absolute convergence - simple problems.

Text Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Allied Mathematics	Dr.P.R.Vittal.	Margham publications Chennai-17.	2000.
2.	Methods of Real Analysis	Richard.R. Goldberg	IBM publishing,New Delhi	1970
3.	Mathematical Analysis	S.C.Malik.		

Reference Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Mathematical analysis	Tom.M.Apostel	Narosa publications,New Delhi.	2002
2.	Real Analysis	M.S.Rangacgari.	New century Book House,Chennai	1996.

Allied I - Mathematics

(for B.Sc. Statistics Major students admitted from the year 2008 - 2009 on wards)

Course II - Mathematics

First year / First semester and Second semester.

Unit I , Unit II , Unit III - First Year / First semester - 2 Hours / Week

Unit IV, Unit V - First Year / Second Semester - 2 Hours / Week

Course Code – 08UMAA05

Max Marks : 75

Unit I

Matrix theory – Characteristic equation - Eigen values – Eigen vectors - simple properties - Cayley Hamilton Theorem (statement only) -verification of the theorem – Finding the inverse of matrix by using Cayley Hamilton theorem.

Unit II

Beta and Gamma functions – Definitions of Beta and Gamma functions – properties of Beta and Gamma functions – Evaluation of multiple integrals using Beta and Gamma functions.

Unit III

Fourier series – Definition - Fourier coefficients – Periodic functions with period 2π .

Unit IV

Laplace transforms – Definition – Linear property – shifting property - Change of scale property - Laplace Transforms of derivatives - Laplace Transforms of integral - problems.

Unit V

Inverse Laplace Transforms – Solving problem by using the properties of inverse Laplace Transforms – Finding the solution differential equations (second order) problems by using this Laplace Transforms.

Note: University Examination will be conducted at the end of even semester.

Text Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Allied Mathematics	Dr.P.R.Vittal.	Margham Publications, Chennai.	2002.
2.	Allied Mathematics.	A.Singaravelu.	Meenakshi Traders, Chennai.	2002

Reference Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Allied Mathematics	T.K.Manickava sagam Pillai.	S.Viswanathan and co ,Chennai.	1992.

Allied I - Mathematics.

(For B.Sc. Statistics Major students admitted from the year 2008-2009 onwards)

Course III - Mathematics

First Year / Second semester

Course code – 08UMAA06

Max Marks :75.

Unit I

Ordinary Differential Equations – Second order Differential equations with constant coefficients – Particular integrals of the type $e^{ax}.V$ where V is x or x^2 or $\cos ax$ or $\sin ax$ – Second order differential equations with variable coefficients.

Unit II

Finite differences - Definition of interpolation and extrapolation - Finite differences relation between the operators Δ and E - Forward and Backward difference tables – Newton's forward formula - Newton's backward formula – Lagrange's formula.

Unit III

Limits and continuity – Limit of a function on the real line – Limit of a function of addition , subtraction , multiplication – Right hand and left hand limit – continuity of a function – simple problems to verify continuity.

Unit IV

Differentiability – Derivative at a point – Right hand and left hand derivative – Derivative of addition , subtraction and multiplication of functions – derivative of a function with continuity - simple problems.

Unit V

Theorems on Differentiability -Verification of differentiability and continuity – Rolle's theorem – Lagrange's Mean Value Theorem – Cauchy's Mean Value Theorem – Taylor's Theorem with Lagrange's form of remainder - Verification of theorems.

Text Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Real Analysis.	J.N.Sharma and A.R.Vasishtha.		
2.	Calculus –Volume II	T.K.Manickava sagam P[llai and S.Narayanan.	Viswanathan & co, Chennai.	
3.	Allied Mathematics	Dr P.R.Vittal.	Margham publications, Chennai.	

Reference Books :-

S.NO	Tiltle of the Book	Author	Publishing Company	Year of Publication
1.	Methods of Real Analysis	Richard.R. Goldberg.	IBM publishing, New Delhi.	1970.

First Year / First Semester
Allied I - Course I – Basic Mathematics
(For B.Sc., Bioinformatics Students admitted from the year 2008 – 2009 onwards)

Course Code : 08UMAA09

Max Marks :75

Unit I

Algebra : Binomial – Exponential – Logarithmic series (statement only) – Application to summation of above series – problems.

Unit II

Matrices : Determinant of a Matrix - Inverse of a Matrix – Characteristic equation of a matrix – Eigen values – Solution of simultaneous linear equations in three variables using matrices.

Unit III

Differential Calculus : Differentiation of algebraic , exponential , logarithmic and trigonometric functions – Partial differentiation – Euler’s theorems – simple problems

Unit IV

Integral Calculus : Integration of simple algebraic , exponential and trigonometric functions – substitution methods – Integration by parts.

Unit V

Laplace Transforms : Laplace Transforms of standard functions – Inverse Laplace Transforms – Solving ordinary differential equations of second order with constant coefficients only – simple problems.

Text Books :

S.No	Name of the Book	Author	Publishing Company	Year Of Publication.
1	Calculus – Volume I,& II.	T.K.Manickavasagam pillai & others	Vijay Nicole Imprints Pvt Ltd, # C-7,Nelson Chambers, 115,Nelson Manickam Road,Chennai.	2004
2.	Algebra – Volume -I	T.K.Manickavasagam pillai and others.	Same as above	2004

Allied I - Mathematics

Course I – Discrete Mathematics

First Year / First Semester

Course Code : 08UMAA10

Max Marks : 75

Unit I

Mathematical Logic : Statements and Notation – Connectives – Negation – Conjunction – Disjunction – Statement formulas and truth tables – conditional – biconditional – Well – formed Formulas – Tautologies – Equivalence & Duality – Normal Forms – DNF , CNF , PDNF , PCNF .

Unit II

The Theory of Inference for the Statement Calculus – Validity Using Truth Tables - Rules of Inference- Theory of predicate calculus – Valid formulae – Equivalences.

Unit III

Algebraic systems – Definition & Examples – semigroups and Monoids – Definition and examples – Homomorphism of semi groups & monoids - sub semigroups & submonoids. – Polish rotation – conversion of Infix to polish – Group codes – The communication model and basic notations of Error correction – Generation of codes by using parity checks – Error recovery in group codes.

Unit IV

Relations & Ordering – Relations – Properties of binary relation in a set – Functions - Definition & Introduction – composition of Functions – Inverse Function – Binary and n- array operations – Hashing Functions – Natural numbers – Peano Axioms & mathematical induction – Cardinality

Unit V

Lattices as partially ordered sets – Definition and example – some properties of Lattices – sub Lattices – Direct product and Homomorphism – Boolean Algebra – Definition and Example – sub algebra – Direct product and Homomorphism – Boolean Functions – Boolean forms and Free Boolean Algebra – Values of Boolean expression and Boolean Function.

Text Book :

S.No	Name of the Book	Author	Publishing company	Year of Publication
1.	Discrete Mathematical structures with Applications to Computer science	J.P.Trembley R. Manohar	Tata McGraw – Hill, NewDelhi.	2001

Reference Book :

S.No	Name of the Book	Author	Publishing Company	Year of Publication
1.	Discrete Mathematics	Prof.V.Sundaresan, K.S. Ganapathy Subramaniam, K.Ganesan.	Tata Mc Graw Hill, New Delhi.	2000
2.	Discrete Mathematics	L.Lovarz, J.Pelikan, K.Vexztergombi.	Springer International Edition	2002

Allied I – Mathematics

First Year / First Semester & Second Semester

Course II - Numerical Methods

For Unit I, Unit II, and Unit III – First Year / First Semester – 2 Hours / Week

For Unit IV and Unit V – First Year / Second Semester – 2 Hours / Week

Course Code : 08UMAA11

Max Marks : 75

Unit I

Solution of Algebraic and Transcendental Equations – Introduction – Regula Falsi Method – Bisection Method – Iteration Method – Newton – Raphson Method – Problems.

Unit II

Calculus of Finite Differences – Introduction – Forward Differences – Backward Differences – Central Differences – Operators – Forward Differences – Backward Differences – Fundamental Theorem of Difference Calculus – Difference Operator Δ and E – Problems.

Unit III

Interpolation with equal intervals – Newton's Forward and Backward Interpolation Formula – Central Difference Interpolation Formula – Gauss's Forward and Backward Interpolation formula – Bessel's Formula – Stirling's Formula – Problems.

Unit IV

Numerical Differentiation and Numerical Integration – Derivatives using Newton's Forward – Newton's Backward – Stirling's Formula – Numerical Integration – General Quadrature Formula – Trapezoidal Rule – Simpson's 1/3 Rule – Simpson's 3/8 Rule – Problems.

Unit V

Numerical solutions of Ordinary Differential First and Second Order Equations – Introduction – Taylor's Series Method – Euler's Method – Modified Euler's Method – Runge Kutta Methods – Problems.

Note : The University Examination will be conducted at the end of even semester.

Text Books :

S.No	Name of the Book	Author	Publishing Company	Year of Publication
1.	Numerical Methods For Science And Engineering Computation	M.K.Jain, S.R.K.Iyenger & R.K.Jain.	New Age International Pvt .Ltd.	
2.	Numerical Methods	E.Balagurusamy	Tata McGraw Hill Publishing company Ltd,New Delhi	2002

Reference Books:

S.No	Name of The Book	Author	Publishing Company	Year Of Publication
1.	Introductory Methods of Numerical Analysis	S.S.Sastry	Ptentice Hall of India Private Ltd ,New Delhi.	2000
2.	Engineering Numerical Methods	T.K.Manickavasagam and Narayanan	S.Viswanathan &Co, Chennai	1998

Allied I - Mathematics

First Year / Second Semester

Course III – Graph Theory

Course Code : 08UMAA12

Max Marks :75

Unit I

Graph – Definition 1.2 – Applications of Graph – 1.3 Finite and Infinite Graphs – 1.4. Incidence and Degree – 1.5. Isolated Vertex – Pendant Vertex – Null Graph.

Unit II

Isomorphism – 2.2 Sub graphs – 2.3 A Puzzle with multicoloured – 2.4 Walks, paths and circuits – 2.5 Connected Graphs – Disconnected Graphs and components.

Unit III

2.6 Euler Graphs – 2.7 operations on Graphs – 2.8 More on Euler Graphs – 2.9 Hamiltonian and circuit – 2.10 The Travelling salesman problem.

Unit IV

Trees 3.2 Properties of Trees – 3.3 Pendent Vertices in a Tree – 3.4. Distance and centres in a Tree – 3.5 Rooted and Binary Trees.

Unit V

On Counting Trees – 3.7 Spanning Trees – 3.8 – Fundamental circuits – 3.9 Finding all spanning Trees of a Graph.

Text Books:

S.No	Name of the Book	Author	Publishing Company	Year Of Publication
1.	Graph Theory with applications to Engineering and computer science	Narasingh Deo	Ptentice Hall of India, New Delhi.	-

Reference Books :

S.No	Name of the Book	Author	Publishing Company	Year Of Publication
1.	Graph Theory	Harary	Narosa publications, New Delhi	-
2.	A First look at Graph Theory	John Clark	Allied Publications Ltd, Madras.	-

Non Major Elective Course I - Competitive Examination Paper - I

Course Code : 08UMANE01

Max Marks : 75

Unit I

H.C.F. and L.C.M.

Unit II

Square Roots and Cube Roots – Averages.

Unit III

Problems on Numbers – Problems on Ages.

Unit IV

Surds and Indices – Profit and Loss.

Unit V

Partnership.

Text Books :

S.No	Name of the Book	Author	Publishing Company	Year Of Publication.
1.	Quantitative Aptitude For Competitive Examinations	R.S.Aggarwal	S.Chand Co Ltd ,152,Annasalai,Chennai.	2001

Non Major Elective Course II – Competitive Examination Paper II

Course Code :08UMANE02

Max Marks :75

Unit I

Time and Work – Time and Distance

Unit II

Problems on trains – Boats and streams

Unit III

Simple and Compound interest – Area , Volume and Surface Area.

Unit IV

Stocks and Shares – Permutations and Combinations.

Unit V

True Discount, Banker's Discount – Odd Man Out Series.

Text Books:

S.No	Name of the Book	Author	Publishing Company	Year Of Publications
1.	Quantitative Aptitude for competitive Examinations	R.S.AggarWal	S.Chand Co Ltd ,152 ,Annasalai ,Chennai.	2001

Non Major Elective Course III –Matrix Algebra

Course Code : 08UMANE03

Max Marks :75

Unit I

Definition of Matrix – Addition ,Subtraction , Multiplication of Matrices .

Unit II

Transpose of a Matrix – Adjoint of a Matrix – Inverse of the Matrix.

Unit III

Symmetric , Skew symmetric , Hermitian and Skew Hermitian Matrix – Problems.

Unit IV

Rank of The Matrix – Definition – Finding Rank of the Matrix – Problems upto 3x3 Matrix.

Unit V

Cayley Hamilton Theorem (statement only) – Problems only.

Text Books :

S.No	Name of The Book	Author	Publishing Company	Year of Publications
1.	Allied Mathematics	Dr.P.R.Vittal	Margham Publications,Chennai -17	2000

Non Major Elective Course IV – Numerical Methods

Course Code : 08UMANE04

Max Marks : 75

Unit I

Solution of algebraic and Transcendental Equations – Bisection Method - Newton – Raphson Method.

Unit II

Finite difference – Definition – First difference – Higher differences – Difference tables – Expression of any value of Y in terms of the initial value Y_0 and differences.

Unit III

Newton Forward difference – Simple problems.

Unit IV

Newton Backward difference – Simple problems.

Unit V

Central differences – Properties of the operator D – simple problems.

Text Books :

S.No	Name of the Book	Author	Publishing Company	Year Of Publication
1.	Introductory methods of Numerical Analysis – 2 nd Edition	S.S.Sastry	Prentice Hall of India Pvt Ltd, New Delhi	1990
2.	Numerical Methods in Science and Engineering – 2 nd Edition (revised)	Dr.M.K.Venkataraman	The National Publishing Company, Chennai.	

Non Major Elective Course V – Linear Programming

Course Code : 08UMANE05

Max Marks :75

Unit I

Definition of O.R. – Graphical Method .

Unit II

Simplex Method using Slack Surplus Variables.

Unit III

Transportation Problem – Definition – Finding only initial basic solution by using North –West corner Rule – Vogel’s Approximation Method – Lowest cost entry Method.

Unit IV

Assignment Problem – Definition –Finding optimal solution by using Hungarian Method

Unit V

Sequencing Problem – Definition – N jobs to be operated on Two Machines – Problems.

Text Books:

S.No	Name of the Book	Author	Publishing Company	Year Of Publications
1.	Operations Research	P.K.Gupta,Man Mohan,Kanti Swarup-9 th Edition	Sultan Chand & Sons,New Delhi.	2001

Non Major Elective Course VI – Operations Research

Course Code : 08UMANE06

Max Marks :75

Unit I

Inventory Models – Introduction – Definition of Inventory Models

1.Uniform Rate of demand,infinite rate of production and no shortages.

Unit II

Inventory Models – Probabilistic Type – News paper Boy Problem –Discrete case only Problem.

Unit III

Queuing Theory – Definition – Model (M/M/1) : (∞ /FCFS) – Problems.

Unit IV

Network – Definition of Network,Event ,Activity, Critical Path,Slack – Critical Path Method. – Problems.

Unit V

Network –Definition PERT ,Three time estimates – PERT Algorithm –Problems.

Text Books :

S.No	Name of the Book	Author	Publishing Company	Year Of Publications
1.	Operations Research	P.K.Gupta,ManMohan and KantiSwarup -9th Edition	Sultan Chand and sons,NewDelhi	2001

List of Examiners and Question Paper Setters:-

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Chennai
4. Prof. S.Selvarangam
S.G. Lecturer in Mathematics ,
Presidency College,
Chennai.
5. Dr.Ponnusamy,
Reader in Mathematics,
Government Arts College,
Coimbatore.
6. Dr.Sitrarasu,
H.O.D. of Mathematics,
Kongu Nadu Arts and Science College,
Coimbatore.
7. Dr.T.Thamizhselvan,
Prof. and Head of the Department,
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Tirunelveli.
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Erode.