PONDICHERRY UNIVERSITY

(A CENTRAL UNIVERSITY)

B.Sc. MATHEMATICS
(CBCS)

REGULATIONS & SYLLABUS

2017-2018 ONWARDS

Eligibility Criteria for Admission to B.Sc Mathematics

1. A pass in Higher secondary with Mathematics (not Business Mathematics) as one of the subjects of study.

2. For the definitions of Keywords, Grading and Computation of SGPA and CGPA, refer guidelines for choice based credit system of UG Programmes in Arts, Science and Commerce, issued by Pondicherry University from the academic year 2017-18.

SCHEME FORCHOICE BASED CREDIT SYSTEM
IN
B.Sc. MATHEMATICS PROGRAMME
(To be implemented from 2017-18 onwards)

COURSE	SUBJECT CODE	TITLE OF THE PAPER	CREDITS	
			Lecture	Tut/Prac
SEMESTER-I 20 Credits				
MIL – 1	LBEN/LHIN/LMAL/LSAN/	Bengali/Hindi/Malayalam/Sanskrit/	03	
ENGLISH –	ENGL 112	English – I	03	
DSC – 1A	MATH 111	Theory of Equations and Trigonometry	04	02
DSC – 2A	MATH 112	Differential Calculus	04	02
AECC – 1	PADM 113	Public Administration	02	
SEMESTER-II20 Credits				
MIL – 2	LBEN/LHIN/LMAL/LSAN/	Bengali/Hindi/Malayalam/Sanskrit/	03	
ENGLISH –	ENGL 122	English – II	03	
DSC – 1B	MATH 121	Analytical Geometry – 3D	04	02
DSC – 2B	MATH 122	Integral Calculus	04	02
AECC – 2	ENVS 123	Environmental Studies	02	
SEMESTER-III20 Credits				
DSC – 1C	MATH (231)	Abstract Algebra	04	02
DSC – 2C	MATH (232)	Real Analysis - I	04	02
DSC – 3C	MATH (233)	Statics	04	02
SEC – 1	MATH (234)	Vector Calculus	02	
SEMESTER-IV 20 Credits				
DSC – 1D	MATH (241)	Linear Algebra	04	02
DSC – 2D	MATH (242)	Real Analysis - II	04	02
DSC – 3D	MATH (243)	Dynamics	04	02
SEC – 2	MATH (244)	Logic and Lattices	02	
SEMESTER-V20 Credits				
SEC – 3	MATH (351)	Programming Lab in C - Practical		02
*DSE – 1A *DSE – 2A *DSE – 3A	MATH (352)	Complex Analysis - I	04	01
	MATH (353)	Operation Research - I	04	01
	MATH (354)	Ordinary Differential Equations and Laplace Transforms	04	01
	MATH (355)	Graph Theory	04	01
	MATH (356)	Mathematical Statistics - I	04	01
GE – 1	MATH (357)	Programming in C	03	
SEMESTER-VI20 Credits				
SEC – 4	MATH (361)	Programming Lab in Numerical methods using C - Practical		02
*DSE – 1B *DSE – 2B *DSE – 3B	MATH (362)	Complex Analysis -II	04	01
	MATH (363)	Operation Research - II	04	01
	MATH (364)	Partial Differential Equations	04	01
	MATH (365)	Fourier Series and Fourier Transform	04	01
	MATH (366)	Mathematical Statistics - II	04	01
GE – 2	MATH (367)	Numerical Methods using C	03	

LIST OF DISCIPLINE SPECIFIC CORE COURSES

(THEORY: 4 CREDITS AND TUTORIAL: 2 CREDITS)   10 * 6 = 60 Credits

COURSE NAME	PAPER CODE	TITLE OF THE PAPER
DSC – 1A	MATH 111	Theory of equations and Trigonometry
DSC – 2A	MATH 112	Differential Calculus
DSC – 1B	MATH 121	Analytical Geometry of 3D
DSC – 2B	MATH 122	Integral Calculus
DSC - 1C	MATH 231	Abstract Algebra
DSC – 2C	MATH 232	Real Analysis -1
DSC - 3C	MATH 233	Statics
DSC – 1D	MATH 241	Linear Algebra
DSC – 2D	MATH 242	Real Analysis -II
DSC – 3D	MATH 243	Dynamics

LIST OF SKILL-ENHANCEMENT ELECTIVE COURSES (SEC)

(2 CREDITS FOR EACH PAPER)4* 2= 8 credits

COURSE NAME	PAPER CODE	TITLE OF THE PAPER
SEC-1	MATH 234	Vector Calculus
SEC-2	MATH 244	Logic and Lattices
SEC-3	MATH 351	Programming Lab in C - Practical
SEC-4	MATH 361	Programming Lab in Numerical methods using C - Practical

LIST OF DISCIPLINE SPECIFIC ELECTIVES (DSE)

(THEORY: 4 CREDITS AND TUTORIAL: 1 CREDIT)   6 * 5 = 30 Credits

COURSE NAME	PAPER CODE	TITLE OF THE PAPER
DISCIPLINE – A* DSE – 1A DSE – 2A DSE – 3A	MATH 352	Complex Analysis - I
	MATH 353	Operations Research - I
	MATH 354	Ordinary Differential Equations and Laplace Transform
	MATH 355	Graph Theory
	MATH 356	Mathematical Statistics - I
DISCIPLINE – B* DSE – 1B DSE – 2B DSE – 3B	MATH 362	Complex Analysis - II
	MATH 363	Operations Research - II
	MATH 364	Partial Differential Equations
	MATH 365	Fourier series and Fourier Transform
	MATH 366	Mathematical Statistics - II

*Select 3 courses from each of the DISCIPLINE – A and DISCIPLINE -B

LIST OF GENERIC ELECTIVE (GE)

(THEORY: 3 CREDITS)   2 * 3 = 6 Credits

COURSE NAME	PAPER CODE	TITLE OF THE PAPER
GE – 1	MATH 357	Programming in C
GE -2	MATH 367	Numerical Methods using C

CHOICE BASED CREDIT SYSTEM IN
B.Sc. MATHEMATICS PROGRAMME
To be implemented form 2017-18 onwards

Distribution of Workload
(one credit hour is equivalent 1.5 hours)

SEMESTER	SUBJECT CODE	TITLE OF THE PAPER	CREDITS		CONTACT HOURS / WEEK	
			THEORY	TUT	THEORY	TUT
I (20 Credits)	LBEN/LHIN/ LMAL/LSAN/ LTAM/LTEL 111	Bengali/Hindi/ Malayalam/ Sanskrit/Tamil/ Telugu	03	-	5	0
	ENGL 112	ENGLISH – I	03		5	0
	MATH 111	Theory of Equation and Trigonometry	04	02	6	3
	MATH 112	Differential Calculus	04	02	6	3
	PADM 113	Public Administration	02	-	2	0
II (20 Credits)	LBEN/LHIN/ LMAL/LSAN/ LTAM/LTEL 121	Bengali/Hindi/ Malayalam/Sanskrit/ Tamil/Telugu	03	-	5	0
	ENGL 122	ENGLISH – II	03	-	5	0
	MATH 121	Analytical Geometry of 3D	04	02	6	3
	MATH 122	Integral calculus	04	02	6	3
	ENVS 123	Environmental Studies	02	-	2	0

SEMESTER	SUBJECT CODE	TITLE OF THE PAPER	CREDITS		CONTACT HOURS / WEEK	
			THEORY	TUT	THEORY	TUT
III (20 Credits)	MATH (231)	Abstract Algebra	04	02	6	3
	MATH (232)	Real Analysis I	04	02	6	3
	MATH (233)	Statics	04	02	6	3
	MATH (234)	Vector Calculus	02	-	3	0
IV (20 Credits)	MATH (241)	Linear Algebra	04	02	6	3
	MATH (242)	Real Analysis II	04	02	6	3
	MATH (243)	Dynamics	04	02	6	3
	MATH (244)	Logic and Lattices	02	-	3	0

SEMESTER	SUBJECT CODE	TITLE OF THE PAPER	CREDITS		CONTACT HOURS / WEEK	
			THEORY	TUT/PRAC	THEORY	TUT/PRAC
V (20 Credits) Select any three from MATH- 352 to MATH - 356	MATH (351)	Programming Lab in C - Practical	--	02	0	4
	MATH (352)	Complex analysis - I	04	01	6	1
	MATH (353)	Operations Research - I	04	01	6	1
	MATH (354)	Ordinary differential Equations	04	01	6	1
	MATH (355)	Fourier Series and Fourier Transform	04	01	6	1
	MATH (356)	Mathematical Statistics-I	04	01	6	1
	MATH (357)	Programming in C	03	--	5	0

SEMESTER	SUBJECT CODE	TITLE OF THE PAPER	CREDITS		CONTACT HOURS / WEEK	
			THEORY	TUT/PRAC	THEORY	TUT/PRAC
VI (20 Credits) Select any three from MATH- 362 to MATH - 366	MATH (361)	Programming Lab in Numerical Methods using C - Practical	--	02	0	4
	MATH (362)	Complex analysis - II	04	01	6	1
	MATH (363)	Operations Research – II	04	01	6	1
	MATH (364)	Partial Differential Equations	04	01	6	1
	MATH (365)	Graph Theory	04	01	6	1
	MATH (366)	Mathematical Statistics-II	04	01	6	1
	MATH (367)	Numerical Methods using C	03	0	5	0

DETAILS OF SYLLABUS

For

B.Sc. MATHEMATICS PROGRAMME

Under

CHOICE BASED CREDIT SYSTEM

Offered in affiliated Colleges of Pondicherry University from the academic year

2017-18 onwards

Degree	B.Sc	Branch	MATHEMATICS			
Year	I	Course Name	DSC – 1A	Credits	Theory	4
Semester	I	Course Code	MATH 111		Tutorial	2
Paper Name	**THEORY OF EQUATIONS AND TRIGONOMETRY**					
UNIT I	Relations between the roots and the coefficients of a general polynomial equations in one variable – Transformation of equations – Descarte's rule of signs.					
UNIT II	Solution of cubic equations :Cardon's Method - Trigonometrical method – Horner's Method, Bi-quadratic equation – Ferrari method.					
UNIT III	De Moivre's theorem and its applications – Direct and Inverse circular and hyperbolic functions.					
UNIT IV	Logarithm of a complex quantity- Expansion of Trigonometrical functions.					
UNIT V	Gregory's series- Summation of series.					
Prescribed Text(specify sections clearly)	1. *Algebra Volume-1, T.K. Manicavachagom Pillay , T.Natarajan and K.S. Ganapathy,. Viswanathan (Printers & Publishers) Pvt. Lid, (1999)* 2. *Trigonometry, S. Narayanan and T.K. Manicavachagom Pillai, S. Viswanathan (Printers & Publishers) Pvt. Ltd, (1997)*					
Recommended books	*Trigonometry, P.R. Vittal and Malini, Algebra and Margham Publications (2008)*					
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*					

Degree	B.Sc	Branch	MATHEMATICS			
Year	I	Course Name	DSC -2A	Credits	Theory	4
Semester	I	Course Code	MATH 112		Tutorial	2
Paper Name	DIFFERENTIAL CALCULUS					
UNIT I	n^{th} derivative – Standard results – Trigonometrical transformation – Formation of equations involving derivatives – Leibnitz formula.					
UNIT II	Total differential coefficients – Euler's theorem - Partial derivatives of a function of two functions -Equations of tangent and normal - Taylor expansions of single and double variables.					
UNIT III	Maxima and Minima of two variables – Lagrange's method of undetermined multipliers - Angle of intersection of curves – Sub tangent and Sub Normal. -					
UNIT IV	Angle between the radius vector and tangent – Angle between the intersection of two curves – Polar sub tangent and sub normal.					
UNIT V	Circle, radius and centre of curvature – Cartesian formula for radius of curvature – envelope.					
Prescribed Text(specify sections clearly)	Calculus Volume — I, T. K. Manickavachagom Pillai, Printers and Publishers (May1992 Edition) Unit 1 : Chapter 3 Unit 2: Chapter 8 Unit 3 : Chapter 8, 9 Unit 4 : Chapter 9 Unit 5 : Chapter 10 (Section 1)					
Recommended books	Calculus by Shanti Narayanan					
e-Learning Source	http://ndl.iitkgp.ac.in http://ocw.mit.edu http://mathforum.org					

Degree	B.Sc	Branch	MATHEMATICS			
Year	I	Course Name	DSC – 1B	Credits	Theory	4
Semester	II	Course Code	MATH 121		Tutorial	2

Paper Name	**ANALYTICAL GEOMETRY - 3D**
UNIT I	**Angle between 2 lines-projections-direction cosines-relation betweenthe direction cosines of a straight line-the projection of the line joining $P(x_1,y_1,z_1)$ and $Q(x_2,y_2,z_2)$ on any line with d.c.'sl,m,n.-direction cosines of any line joining 2 points-angle between the lines whose direction cosines are (l_1,m_1,n_1) and (l_2,m_2,n_2).**
UNIT II	**General equation, angle between two planes, length of perpendicular from a given point to a plane, equations of the plane bisecting the angle between two planes.**
UNIT III	**Symmetrical form, line through two points , reduction of unsymmetrical form to the symmetrical form - condition for a line to lie on a plane - plane through a line - condition for the two lines to be coplanar (Cartesian form) - equation of the plane containing two lines - To find the shortest distance between two skew lines - equation of the shortest Distance in Cartesian.**
UNIT IV	**Equation of a sphere with given centre and radius - general equation of a sphere - diameter form - and circular section.**
UNIT V	**Equation of a Cone with its vertex at the origin - equation of a quadratic cone with given vertex and given guiding curve - necessary condition for general equation of second degree to represent a cone - circular cone - equation of circular cone with given vertex - axis and semi vertical angle.**
Prescribed Text(specify sections clearly)	1. *A Text Book of Analytical Geometry of Three dimensions by T.K.Manickavachagom Pillai and T.NatarajanS. Viswanathan Printers 8r. Publishers) — (2008)*
Recommended books	*1. Text Book of Analytic Geometry -2D, P. DuraiPandian, EMERALD Publishers (1968)* *2.Simplified Course in Solid Geometry(3D) by H.K.Dasse, H.C.Saxena, M.D.Raisinghania – S.Chand& Company*
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*

Degree	B.Sc	Branch	MATHEMATICS			
Year	I	Course Name	DSC -2B	Credits	Theory	4
Semester	II	Course Code	MATH 122		Tutorial	2
Paper Name	INTEGRAL CALCULUS					
UNIT I	Integration of rational algebraic functions – Integration of irrational algebraic functions - Properties of definite integrals					
UNIT II	Integration by parts – Bernoulli's formula – Reduction formulae					
UNIT III	Evaluation of double integral – Changing of order of integration - Double integral in Polar co-ordinates – Triple integral					
UNIT IV	Jacobian – Change of variables in the case of two variable and three variables – Transformation from Cartesian to polar co-ordinate - Transformation from Cartesian to spherical co-ordinates -					
UNIT V	Properties – relation between Beta and Gamma functions - Recurrence formula					
Prescribed Text(specify sections clearly)	*Calculus Volume II , S.Narayanan and T.K. Manickavasagam Pillai (2008)* *Unit I : Chapter 1 : 7.3, 7.4, 7.5, 8, 11* *Unit II : Chapter 1: 12,13,* *Unit III: Chapter 5 : 2.1, 2.2, 3.1, 4* *Unit IV : Chapter 6: 1.1, 1.2, 2.1,2.2,2.3,2.4* *Unit v: Chapter 7: 2.1, 2.2, 2.3, 3, 4, 5*					
Recommended books	*1. Integral Calculus, N. P. Bali, Laxmi Publications, Delhi, (1991)* *2. Calculus, George B.Thomas, Jr. and Ross L. Finney, 9' Edition, Pearson Education,(2006).*					
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*					

Degree	B.Sc	Branch	MATHEMATICS			
Year	II	Course Name	DSC -1C	Credits	Theory	4
Semester	III	Course Code	MATH 231		Tutorial	2
Paper Name	ABSTRACT ALGEBRA					
UNIT I	Definition of Group - examples of groups - Some preliminary lemmas - Subgroups.					
UNIT II	A counting principle - Normal subgroups and Quotient Groups – Homomorphisms.					
UNIT III	Automorphisms - Cayley's theorem - Permutation groups.					
UNIT IV	Definition of Ring- examples of a rings - Some special classes of rings - Homomorphisms – Ideals and quotients rings.					
UNIT V	More ideals and quotients rings -The field of quotients of an integral domain.					
Prescribed Text(specify sections clearly)	*I.N. Herstein, Topics in Algebra (Second Edition),John Wiley& Sons (2003)* *Unit I : Sections 2.1 to 2.4* *Unit II : Sections 2.5 to 2.7(except applications 1 & 2 of 2.7)* *Unit III: Sections 2.8 to 2.10* *Unit IV: Sections 3.1 to 3.3* *Unit V : Sections 3.4,3.6*					
Recommended books	1. *A First course in Algebra by J. B. Fraleigh,Addison Wesley.* 2. *Modern Algebra by M.L. Santiago, (TMG)* 3. *Modern Algebra by S.Arumugam, Issac A. T, Scitech Publications.*					
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*					

Degree	B.Sc	Branch	MATHEMATICS			
Year	II	Course Name	DSC - 2C		Theory	4
Semester	III	Course Code	MATH 232	Credits	Tutorial	2

Paper Name	REAL ANALYSIS - I
UNIT I	Sets and elements — Operations on sets — Functions - Real valued functions - Equivalence — Countability — Real numbers — Least upper bound — Greatest lower bound.
UNIT II	Definition of sequence and subsequence — Limit of a sequence — Convergent sequence — Bounded sequence Monotone sequence - Operation on convergent sequence - Limit superior and limit inferior — Cauchy sequence
UNIT III	Convergence and divergence- Series with non - negative terms - Alternating series — Conditional convergence and absolute convergence - Tests for absolute convergence - Series whose terms form a non -increasing sequence — Summation by parts.
UNIT IV	Limit of a function on the real line - Metric spaces (Examples 4 and 5 under 4.2 c to be omitted) - Limits in metric spaces.
UNIT V	Functions continuous at a point on the real line Reformulation — Functions continuous on a metric space - Open sets and closed sets – Discontinuous functions on R
Prescribed Text(specify sections clearly)	*Methods of Real Analysis, Treatment as in Richard R. Goldberg(1970)* *Unit 1 : Chapter 1* *Unit 2, 3: Chapter 2 and Chapter 3 (up to 3.8)* *Unit 4 : Chapter 4* *Unit 5 : Chapter 5*
Recommended books	1. *A First Course in Mathematical Analysis- D somasundaram& B Choudhyri- Narosa Publishing house New Dehli* 2. *Real Analysis- Shanti Narayanan*
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*

Degree	B. Sc	Branch	MATHEMATICS			
Year	II	Course Name	DSC- 3C	Credits	Theory	4
Semester	III	Course Code	MATH 233		Tutorial	2
Paper Name	STATICS					
UNIT I	Definition of a Force-Types of Forces: Gravity, Tension, Resistance, Friction-Magnitude and Direction of the Resultant of Forces on a particle - Equilibrium of a Particle.					
UNIT II	Equilibrium of a Particle acted on by Three Forces-The Triangle of forces-Necessary and Sufficient conditions for the Equilibrium of a Particle under Three Forces- Lami's Theorem--Necessary and Sufficient conditions for the Equilibrium of a Particle under a System of Forces-Equilibrium of a Particle on a Rough Inclined Plane.					
UNIT III	Equivalent Systems of Forces-Resultant of Parallel Forces-Couples-Resultant of Several Coplanar Forces-Moment of the Resultant Force -Varignon's Theorem-Couples in a Plane or in Parallel planes- Resultant of a Couple and a Force.					
UNIT IV	Equation of the Line of action of the Resultant-Equilibrium of the Rigid body under three coplanar forces.					
UNIT V	Equilibrium of uniform homogeneous string- Sag-Suspension Bridge.					
Prescribed Text(specify sections clearly)	*Mechanics, P. Duraipandian, LaxmiDuraipandian and MuthamizhJayapragasam, S. Chand and Company Ltd, New Delhi (1997) Unit I- Chapter 2; Unit II- Chapter 6; Unit III- Chapter 7 (up to Section 7.9); Unit IV- Chapter 7(Sections 7.10 to 7.12); Unit V: Chapter 11*					
Recommended books	*1. Mechanics(Statics and Dynamics) by S.G Venkatachalapathy, Margham Publications, Chennai.* *2. Golden Statics by N.T. Bali – Laxmi Publications.*					
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*					

Degree	B.Sc	Branch	MATHEMATICS			
Year	II	Course Name	SEC - 1	Credits	Theory	2
Semester	III	Course Code	MATH 234		Tutorial	0
Paper Name	**VECTOR CALCULUS**					
UNIT I	**Gradient of a scalar function –properties – directional derivatives – Divergence of a vector function – Curl of a vector function – related problems**					
UNIT II	**Vector identities – Line integrals – related problems**					
UNIT III	**Surface integrals – Volume integrals**					
UNIT IV	**Green's theorem – Stokes's theorem – Verification of theorems**					
UNIT V	**Gauss divergence theorem – Verification of theorem**					
Prescribed Text(specify sections clearly)	*Engineering Mathematics – II by Dr.M.B.K.Moorthy*					
Recommended books	*Vector Analysis- P.Duraipandian, LaxmiDuraipandian, Emerald Publishers pvt. Ltd. 1990.*					
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*					

Degree	B.Sc	Branch	MATHEMATICS				
Year	II	Course Name	DSC -1D	Credits		Theory	4
Semester	IV	Course Code	MATH 241			Tutorial	2
Paper Name	**LINEAR ALGEBRA**						
UNIT I	**Vector spaces - Elementary Concepts - subspaces**						
UNIT II	**Linear independence - Bases - Dual spaces**						
UNIT III	**Inner product spaces**						
UNIT IV	**Algebra of Linear transformations - Characteristic roots.**						
UNIT V	**Matrices : Canonical forms - triangular forms**						
Prescribed Text(specify sections clearly)	*Topics in Algebra – I.N Herstein, Wiley Eastern Limited* *Chapter -4: Sections 4.1 – 4.4* *Chapter -5; Sections 6.1—6.4*						
Recommended books	*1. First course in Algebra - John B. Fraleigh, Addison Wesley* *2. University Algebra – N. S. Gopalakrishnan - Wiley Eastern Limited* *3. Textbook of Algebra – R. Balakrishnan& N. Ramabadran, Vikas Pub. Co* *4. S. Lipschutz – Beginning Linear Algebra, TMG Hill* *5. M.L.Santiago – Modern Algebra TMG Hill*						
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*						

Degree	B.Sc	Branch	MATHEMATICS			
Year	II	Course Name	DSC-2D	Credits	Theory	4
Semester	IV	Course Code	MATH 242		Tutorial	2
Paper Name	REAL ANALYSIS II					
UNIT I	More about open sets - Connected sets. Bounded sets and totally bounded sets - Complete metric spaces.					
UNIT II	Compact metric spaces Continuous functions on compact metric Spaces - Continuity of the inverse function - Uniform continuity.					
UNIT III	Sets of measure zero - Definition of the Riemann integral - Existence of the Riemann integral - Properties of the Riemann integral					
UNIT IV	Derivatives - Rolle's theorem - The Law of the Mean - Fundamental theorem of Calculus - - Improper integrals.					
UNIT V	Hyperbolic function - The exponential function - The logarithmic function - Definition of x^a - The trigonometric function - Taylor Theorem -L'Hopital's rule.					
Prescribed Text(specify sections clearly)	*Methods of Real Analysis, Treatment as in Richard R. Goldberg, (1970) Unit 1: 6.1 to 6.4 Unit 2: 6.5 to 6.8 Unit 3: 7.1 to 7.4 Unit 4: 7.5 to 7.10 Unit 5: 8.1 to 8.7*					
Recommended books	1. *First Course in Mathematical Analysis by Dr.Somasundaram& B Choudhyri- Narosa Publishing house New Dehli* 2. *Real Analysis- byShanti Narayanan*					
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*					

Degree	B.Sc.	Branch	MATHEMATICS				
Year	II	Course Name	DSC -3D	Credits		Theory	4
Semester	IV	Course Code	MATH 243			Tutorial	2
Paper Name	**DYNAMICS**						
UNIT I	**Velocity- Relative Velocity- Acceleration- Angular Velocity- Relative Angular Velocity- Rectilinear Motion- Work, Power and Energy.**						
UNIT II	**Central Forces and Central Orbit- Equations of a Central Orbit- Law of Force and Speed for a given Orbit- Determination of the orbit when the law of force is given- Kepler's laws of Planetary motion.**						
UNIT III	**Motion of a Projectile- Nature of a Trajectory- Results Pertaining to the motion of a Projectile- Maximum Horizontal Range- Trajectories with a given speed of projection and a given horizontal range- Speed of a Projectile- Range on an Inclined plane- Maximum range on the inclined plane- Envelope of the trajectories.**						
UNIT IV	**Definition of Simple Harmonic Motion- Composition of two Simple Harmonic Motions of the same period. Moment of Inertia-Theorems of moment of Inertia –Theorem of Perpendicular axes- Theorem of parallel axes.**						
UNIT V	**Two Dimensional Motion of a Rigid Body- Motion of a Rigid Body rotating about a fixed axis- Compound Pendulum- Reaction of the axis on a rigid Body revolving about a fixed axis- Equations of Motion for a two dimensional Motion- Motion of a uniform disk rolling down an inclined plane.**						
Prescribed Text(specify sections clearly)	*Mechanics, P. Duraipandian, LaxmiDuraipandian and MuthamizhJayapragasam, S. Chand and Company Ltd, New Delhi (1997)* *Unit I-Chapter 1 and 4;Unit II- Chapter 15; ;Unit III-- Chapter 13(up to Section 13.9);* *Unit IV-Chapter 5(Section 5.1 and 5.3 only) and Chapter 16; Unit V-Chapter 17*						
Recommended books	1. *Mechanics(Statics and Dynamics) by S.G Venkatachalapathy, Margham Publications, Chennai.* 2. *Golden Statics by N.T. Bali – Laxmi Publications.*						
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*						

Degree	B.Sc	Branch	MATHEMATICS			
Year	II	Course Name	SEC - 2	Credits	Theory	2
Semester	IV	Course Code	MATH 244		Tutorial	0
Paper Name	LOGIC AND LATTICES					
UNIT I	Connectives – negation – conjunction – disjunction – statement formulas and truth tables – Conditional and bi conditional - well formed formulas – tautologies – equivalence of formulas – duality law – tautological implications					
UNIT II	Normal forms – disjunctive normal forms – conjunctive normal forms – principal disjunctive normal forms – principal conjunctive normal forms					
UNIT III	Partial ordering – lexicographic ordering – Partially ordered set – Hasse diagram – least member – greatest member – minimal member – maximal member – least upper bound – greatest lower bound					
UNIT IV	Lattice – examples – properties of lattices – lattices as algebraic systems – sub lattices – direct product – homomorphism – order preserving – Special lattices – complete lattice – bounded lattice – complement – complemented lattice – distributive lattice					
UNIT V	Boolean algebra - - properties – examples – sub algebra – direct product – homomorphism – Boolean functions – karnaugh maps for one variable – two variables – three variables					
Prescribed Text(specify sections clearly)	*Discrete Mathematical structures with applications to computer science by J.P.Tremblay and R.Manohar* *Unit 1: 1.1, 1.2.1 to 1.2.4, 1.2.6 to 1.2.12* *Unit 2: 1.3.1 to 1.3.4* *Unit 3: 2.3.8 to 2.3.9* *Unit 4: 4.1.1 to 4.1.5* *Unit 5: 4.2.1 to 4.2.2, 4.3.1 to 4.3.2, 4.4.1 to 4.4.2*					
Recommended books	1. *Lattice theory by Garrett Birkhoff* **2.** Discret Mathematics – M.K. Venkatraman, National Publishing Co, Chenna**i**					
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*					

Degree	B.Sc	Branch	MATHEMATICS				
Year	III	Course Name	**SEC - 3**	Credits	Theory		0
Semester	V	Course Code	**MATH - 351**		Practical		2
Paper Name	**PROGRAMMING LAB IN C - PRACTICAL**						

LIST OF PRACTICALS

1. **Write a program to Convert the temperature in Celsius to Fahrenheit and vice versa**

2. **Write a program to find the Simple interest and Compound interest**

3. **Write program to solve Quadratic equation**

4. **Write a program to generate Prime numbers**

5. **Write a program to generate Fibonacci numbers**

6. **Write a program to find the Biggest and Smallest number from a set of given n numbers**

7. **Write a program to check a given number is a Palindrome or not**

8. **Write a Program to arrange the numbers in ascending / descending order**

9. **Write a program to find the Factorial of a natural number**

10. **Write a program to find the nCr and nPr using functions**

11. **Write a progam to find the Factorial of a natural number using recursion**

12. **Write a program to find the Sum of two matrices**

13. **Write a program to find the Product of two matrices**

14. **Write a program to evaluate** $\sin(x) = x - \dfrac{x^3}{3!} + \dfrac{x^5}{5!} + ...$

15. **Write a program to evaluate** $e^x = 1 + \dfrac{x}{1!} + \dfrac{x^2}{2!} + \dfrac{x^3}{3!} + ...$

e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*

Degree	B.Sc	Branch	MATHEMATICS			
Year	III	Course Name	DSE	Credits	Theory	4
Semester	V	Course Code	MATH 353		Tutorial	1

Paper Name	**COMPLEX ANALYSIS – I**
UNIT I	**Complex numbers - Definitions - Algebraic properties - Cartesian co-ordinates - Triangular inequality - Polar Form - Powers and roots -Region in the complex plane .**
UNIT II	**Analytic functions - Functions of a complex variable - Mapping - Limit - Theorems on limits - Continuity - Derivatives - Differentiation formula - Cauchy Riemann equations - Sufficient conditions.**
UNIT III	**Cauchy Riemann equations in polar form - Analytic functions - Harmonic functions.**
UNIT IV	**Elementary functions - Exponential function - Trigonometric functions and their--properties - Hyperbolic functions - Logarithmic function – Branches - properties of logarithms - Complex exponents - Inverse trigonometric & hyperbolic functions.**
UNIT V	**Mapping by elementary functions - The linear function 1/z - Linear fractional transformation - The function w = exp(z) ,W = sin z, W = Cos z, $z^{1/2}$ - Successive transformation W= z + 1/z.**
Prescribed Text(specify sections clearly)	*Complex Variables and Applications, James Ward Brown and Ruel V Churchill, McGraw - Hill, International Edition (2009)* *UNIT I - chapter 1* *UNIT II - chapter 2* *UNIT III - chapter 2* *UNIT IV - chapter 3* *UNIT V - chapter 4*
Recommend ed books	1. *Functions of a Complex variable by B. S. Tyagi – KedarNath Ram NathPublishers(P) Ltd.* 2. *Complex Analysis by P. Duraipandian and KayalalPachaiappa – S.Chand& Co.*
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*

Degree	B.Sc	Branch	MATHEMATICS			
Year	III	Course Name	DSE		Theory	4
Semester	V	Course Code	MATH 353	Credits	Tutorial	1

Paper Name	**OPERATIONS RESEARCH - I**
UNIT I	**Mathematical formulation of LPP – Graphical Solution of LPP – Definition of LPP – Canonical and Standard forms of LPP – Ordinary Simplex Method to solve LPP (Method and problems only) – Uses of Artificial variables Method (Big – M Method) - Two Phase Method**
UNIT II	**Duality in LPP – Conversion of Primal to Dual – Duality and Simplex Method (Method and problems only) – Dual Simplex Method**
UNIT III	**General Transportation Problems – Finding IBFS for Transportation Problems – North-West corner Method – Least Cost Method – Vogel's approximation Method – Test for Optimality – Degeneracy in Transportation Problems – MODI Method – Unbalanced Transportation Problems**
UNIT IV	**Mathematical formulation of Assignment Problems – Assignment Method – Travelling Salesman Problems**
UNIT V	**Two person zero sum game – MAXIMIN – MINIMAX Principle – Saddle Point – Games without Saddle Point – Graphical solutions of 2 x n and m x 2 games – Dominance Property – General solution of m x n games by LPP**
Prescribed Text(specify sections clearly)	*Operations Research by KantiSwarup , P.K.Gupta and Man Mohan (2006)* *Unit I* *Chapter 2: Sections 2.1 – 2.3, Chapter 3: Sections 3.1 – 3.5* *Chapter 4: Sections 4.1 – 4.4* *Unit 2:* *Chapter 5 : Sections 5.1 – 5.7, 5.9* *Unit3:* *Chapter 10: Sections 10.1 – 10.14* *Unit 4:* *Chapter 11: Sections 11.1 – 11.6* *Unit 5:* *Chapter 17: Sections 17.1 – 17.10*
Recommended books	*Resource Management Techniques(Operations Research) by V. Sundaresan, K. S. Ganapathy Subramanian, K. Ganesan – A. R. Publications*
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*

Degree	B.Sc	Branch	MATHEMATICS			
Year	III	Course Name	DSE		Theory	4
Semester	V	Course Code	MATH 354	Credits	Tutorial	1
Paper Name		**ORDINARY DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS**
UNIT I		**Exact differential equations – Equations of the First, but of higher degree – Equations solvable for dy/dx, solvable for y, solvable for x, Clairaut's form**
UNIT II		**Linear Differential equations with constant co-efficients - Linear differential equations with variable coefficients.**
UNIT III		**Method of Variation of parameters – Simultaneous Linear differential equations with constant coefficients**
UNIT IV		**Laplace transform – basic properties – transforms of derivatives and integrals functions – derivatives and integrals of transforms – transforms of step function – and impulse functions – transforms of periodic functions**
UNIT V		**Inverse Laplace transforms – convolution theorem – initial and final value theorem – solution of linear ODE of second order with constant coefficients using Laplace transform.**
Prescribed Text(specify sections clearly)		1. *Calculus III S.Narayanan and T.K. Manicavachagom Pillay , for Units I,II and III* 2. *Engineering Mathematics - II by Dr. M.B.K. Moorthy for Unit IV and Unit V*
Recommended books		1. *Introductory course in Differential equations , D.A.Murray, Orient Longman (1967)* 2. *Advance Engineering Mathematics , Erwin Kreyzsig, Wiley India Edition (2010)* 3. *Engineering Mathematics , M.K.Venkataraman, National Publications , Chennai (2009)*
e-Learning Source		*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*

Degree	B.Sc	Branch	MATHEMATICS			
Year	III	Course Name	DSE	Credits	Theory	4
Semester	V	Course Code	MATH 355		Tutorial	1
Paper Name	**GRAPH THEORY**					
UNIT I	**Simple graphs – Graph isomorphism – The incidence and Adjacency Matrices –Subgraph – Vertex degree – Paths and connections – Cycles – Shortest path – Dijkstra's algorithm.**					
UNIT II	**Trees – Cut edge and Bonds – Cut vertices – Cayley's formula –Kruskal's algorithm.**					
UNIT III	**Connectivity – Blocks – Applications.**					
UNIT IV	**Euler Tour – Hamiltonian cycles – applications.**					
UNIT V	**Edge colouring – chromatic number – Vizing's theorem.**					
Prescribed Text(specify sections clearly)	*Graph theory with appliations by J.A.Bonday and U.S.R.Murty* *Unit I : Chapter 1* *Unit 2 : Chapter 2* *Unit 3 : Chapter 3* *Unit 4: Chapter 4* *Unit 5: Chapter 6*					
Recommended books	*Graph theory with applications by NarasinghDeo* *Basic graph theory by Saidur Rahman* *Introduction to Graph theory by Douglas*					
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*					

Degree	B.Sc	Branch	MATHEMATICS			
Year	III	Course Name	DSE	Credits	Theory	4
Semester	V	Course Code	MATH 356		Tutorial	1
Paper Name	**MATHEMATICAL STATISTICS - I**					
UNIT I	**Random variables – Distribution function – Discrete random variable – Continuous random variable – Continuous distribution function – Two dimensional random variables – Joint probability function – Mathematical expectation and variance.**					
UNIT II	**Moment generating function – Properties of MGF – Cumulants – Properties of Cumulants – Characteristic function – Properties of characteristic function – Tchebychev's inequality.**					
UNIT III	**Binomial distribution – Moments of binomial distribution – Recurrence relation for the moments of binomial distribution – MGF of Binomial distribution – Characteristic function of Binomial distribution – Fitting a binomial distribution.**					
UNIT IV	**Poisson distribution – Moments of the Poisson distribution – Recurrence relation for moments of Poisson distribution – Moment generating function of Poisson distribution – Characteristic function of Poisson distribution – Fitting a Poisson distribution.**					
UNIT V	**Normal distribution – Properties of normal distribution – Mode, Median, MGF, Moments Points of inflexion, Median deviation about mean, Area property of Normal distribution – Problems using area Properties.**					
Prescribed Text(specify sections clearly)	*Fundamentals of Mathematical Statistics by S.C.Gupta, V.K.Kapoor, Sultan Chand and Sons , 11th edition* *Unit I : 5.1 to 5.4, 6.1 to 6.9* *Unit II : 6.10 to 6.13* *Unit III : 7.2* *Unit IV : 7.3* *Unit V : 8.2.1 to 8.2.11*					
Recommended books	1. *Statistical methods by S.P.Gupta – Sultan Chand.* 2. *Statistics(Theory and Practice) by R.S.N.Pillai& V. Bagavathy - S.Chand& Co.*					
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*					

Degree	B.Sc	Branch	MATHEMATICS			
Year	III	Course Name	GE - 1		Theory	3
Semester	V	Course Code	MATH 357	Credits	Tutorial	0
Paper Name	**PROGRAMMING IN C**					

UNIT I	Main Function – Basic Structure of C Programs – Executing A 'C' Program - Character set – c Tokens - keywords and identifiers – Constants – Variables - Data types – Declarations of variables – User defined type declarations – Assignment statement – Reading data from Keyboard – Defining symbolic constants – Types of Operators – Arithmetic Expressions – Type conversion in expressions – Mathematical functions.
UNIT II	Managing Input and Output operations – Reading a character – Writing a Character – Formatted input – Formatted output – Decision Making with IF statement – Simple IF statement – IF ...ELSE statement – Nesting of IF ... ELSE statement – ELSE IF Ladder.
UNIT III	Switch Statement – Conditional Operator – GOTO statement - Decision making with looping - WHILE statement – DO Statement – FOR statement – Nesting of For Loops - Jumps in Loop – Jumping out of a loop - Arrays – One Dimensional array – Two dimensional arrays – Multi dimensional arrays.
UNIT IV	Character arrays and strings – Declaration of Strings – Reading Strings – Writing strings – Comparison of Strings – String handling functions.
UNIT V	User defined functions – Elements of user defined functions – Definition of functions – Return values and their types – Function call – Function declaration – Category of functions – Nesting functions- Recursion – Passing array to functions – Storage class variable Auto , Extern, static and Register.
Prescribed Text(specify sections clearly)	*Programming In C by E.Balagurusamy , 4th Edition (2009)* *Unit 1: 1.1, 1.2, 1.8 - 1.10, 2.2 -2.12, 3.1- 3.14, 3.16* *Unit 2: 4.1- 4.5, 5.1 - 5.9* *Unit 3: 6 .1- 6.5, 7.1- 7.7, 8.1 - 8.9* *Unit 4,5 : 9.1 - 9.17,9.19*
Recommended books	*Computer Programming in C by Dr.V. Rajaram, Prentice Hall India Pvt. Ltd*
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*

Degree	B.Sc	Branch	MATHEMATICS				
Year	III	Course Name	SEC - 4	Credits	Theory	2
Semester	VI	Course Code	MATH 361		Tutorial	0
Paper Name	PROGRAMMING LAB IN NUMERICAL METHODS USING C					

LIST OF PRACTICALS

1. Write a program to solve algebraic and transcendental equations by Bisection method

2. Write a program to solve algebraic equation and transcendental by Newton-Raphson method

3. Write a program to solve simultaneous linear algebraic equations by Gauss jordan method

4. Write a program to find the inverse of a matrix of order n

5. Write a program to find the determinant of a matrix of order n

6. Write a program to solve simultaneous linear algebraic equations by Gauss Seidal

7. Write a program to evaluate definite integral by Trapezoidal rule

8. Write a program to evaluate definite integral by Simpson's 1/3 rule

9. Write a program to solve first order ODE by Euler's method

10. Write a program to solve the first order ODE by Runge Kutta method

e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*

Degree	B.Sc	Branch	MATHEMATICS			
Year	III	Course Name	DSE	Credits	Theory	4
Semester	VI	Course Code	MATH 362		Tutorial	1
Paper Name	COMPLEX ANALYSIS- II					

UNIT I	Contour integrals- - Examples - The Cauchy Goursat's theorem - A preliminary lemma - Proof of Cauchy Goursat's theorem - Simply and multiple connected domains.
UNIT II	The Cauchy integral formula -Derivatives of analytic functions - Morera's theorem - Maximum moduli of functions-Liouville's theorem- The fundamental theorem of algebra.
UNIT III	Convergence of sequences and series - Taylor series - Observations and examples – Laurent Series (statement only).
UNIT IV	Singularities - Definitions and examples - Residues - The residue theorem - The principal part of a function - Residues and poles – zeros and poles of order m.
UNIT V	**Type 1 :** $\int\limits_{-\infty}^{\infty} \frac{p(x)}{q(x)} dx$ **Type 2 :** $\int\limits_{-\infty}^{\infty} \frac{p(x)}{q(x)} \sin ax$ **dx or** $\int\limits_{-\infty}^{\infty} \frac{p(x)}{q(x)} \cos ax$ **dx** **Type 3 :** $\int\limits_{0}^{2\pi} F(\sin\theta, \cos\theta) d\theta$ **where p(x) and q(x) are real polynomials with no factor in common and q(x) has no real zeros.**
Prescribed Text(specify sections clearly)	*Complex Variables and Applications, James Ward Brown and Ruel V Churchill, McGraw - Hill, International Edition (1990)* *Unit I : Chapter 4:Section 34-38* *Unit II: Chapter 4 Section 39-43* *Unit III:Chapter 5:Section 44-48* *Unit IV:Chapter 6:Section 53-57* *Unit V:Chapter 6:Section 58-60*
Recommended books	1. *Functions of a Complex variable by B. S. Tyagi – KedarNath Ram NathPublishers(P) Ltd.* 2. *Complex Analysis by P. Duraipandian and KayalalPachaiappa – S.Chand& Co.*
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*

Degree	B.Sc	Branch	MATHEMATICS			
Year	III	Course Name	DSE		Theory	4
Semester	VI	Course Code	MATH 363	Credits	Tutorial	1
Paper Name	**OPERATIONS RESEARCH - II**					
UNIT I	**Network and Basic Components – Logical sequence – Rules for Network Construction – Critical Path Analysis – Probability Considerations in PERT – Difference between PERT and CPM**					
UNIT II	**Deterministic inventory Models** 1. **Uniform rate of demand infinite rate of production, no shortage** 2. **Uniform rate of demand, Finite rate of replenishment , no shortages** 3. **Uniform rate of demand, instantaneous Production with shortages** 4. **Uniform rate of demand, instantaneous Production with shortages and fixed time**					
UNIT III	**Queueing Systems – Elements of Queueing systems – Characteristics of queueing Systems – Distribution of Arrivals – Distribution of Inter arrival time – Classification of queueing Models – Deriving Steady state Probabilities for M/M/1 queueing systems - System Measures - Little formula - Deriving Steady state Probabilities for M/M/1 queueing systems with finite capacity - System Measures – Related Problems.**					
UNIT IV	**Multi server queueing Model - Deriving Steady state Probabilities for M/M/c queueing system - System Measures – Deriving Steady state Probabilities for M/M/c queueing system with finite capacity - System Measures – Related Problems.**					
UNIT V	**Methodology of Simulation – Event type simulation – Generation of random numbers – Monte – Carlo Simulation on Inventory Problems - simulation of Queueing Systems.**					
Prescribed Text(specify sections clearly)	*Operations Research by KantiSwarup , P.K.Gupta and Man Mohan (2006)* *Unit 1: Chapter 21: Sections 21.1 – 21.7* *Unit 2: Chapter 19 : Sections 19.1 – 19.7* *Unit3: Chapter 20: Sections 20.1 – 20.8* *Unit 4: Chapter 20: Sections 20.8* *Unit 5: Chapter 23: Sections 23.1 – 23.9*					
Recommended books	*Resource Management Techniques(Operations Research) by V. Sundaresan, K. S. Ganapathy Subramanian, K. Ganesan – A. R. Publications*					
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*					

Degree	B.Sc	Branch	MATHEMATICS			
Year	III	Course Name	DSC	Credits	Theory	4
Semester	VI	Course Code	MATH 364		Tutorial	1
Paper Name	**PARTIAL DIFFERENTIAL EQUATIONS**					
UNIT I	**Formation of Partial differential equations – by elimination of arbitrary constants – by elimination of arbitrary functions – Singular integral – General integral.**					
UNIT II	**Standard types of first order equations – Standard 1,2,3,4 - Equations reducible to standard forms.**					
UNIT III	**Lagrange's equations - Charpit's Method.**					
UNIT IV	**Linear Partial Differential equation of Second and higher order with constant coefficients.**					
UNIT V	**One dimensional wave equations, heat equation, Laplace equation – Simple problems.**					
Prescribed Text(specify sections clearly)	*S.Narayanan and T.K. ManicavachagomPillay , Calculus III* *Unit 1, 2, 3 : Chapter 4* *Transforms and Partial differential equations by Dr. A. Singaravelu* *Unit 4 : Chapter 3* *Unit 5 : Chapter 4*					
Recommended books	1. *Introductory course in Differential equations , D.A.Murray, Orient Longman (1967)* 2. *Advance Engineering Mathematics , Erwin Kreyzsig, Wiley India Edition (2010)* 3. *Engineering Mathematics , M.K.Venkataraman, National Publications , Chennai (2009)*					
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*					

Degree	B.Sc	Branch	MATHEMATICS				
Year	III	Course Name	DSE	Credits	Theory	4	
Semester	VI	Course Code	**MATH 365**		Tutorial	1	
Paper Name	**FOURIER SERIES AND FOURIER TRANSFORM**						
UNIT I	**Dirichlet's condition – General Fourier series Odd and Even functions – Change of interval - Half range Sine and Cosine series expansions**						
UNIT II	**Complex form of Fourier series – Parseval's identity – Harmonic Analysis**						
UNIT III	**Definition – Properties of Fourier Transform – Modulation Theorem – Fourier transform Integrals**						
UNIT IV	**Relation between Fourier and Laplace Transform – Convolution Theorem for a Fourier Transform , Parseval's identity**						
UNIT V	**Fourier sine Transform – Fourier Cosine Transform – Finite Fourier Transform – Finite Fourier sine and cosine transform of the derivatives of a function**						
Prescribed Text(specify sections clearly)	*Engineering Mathematics III-B, Dr.M.K.Venkataraman* *Unit 1,2 : Chapter 1* *Unit 3,4,5 : Chapter 4*						
Recommended books	*Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publications, New Delhi(40th Edition).*						
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*						

Degree	B.Sc	Branch	MATHEMATICS			
Year	III	Course Name	DSC	Credits	Theory	4
Semester	VI	Course Code	MATH 366		Tutorial	1
Paper Name	**MATHEMATICAL STATISTICS - II**					
UNIT I	**Correlation – Properties - Rank Correlation – Bivariate correlation**					
UNIT II	**Regression – Properties – Regression equations**					
UNIT III	**Sampling – Types of sampling – Parameter and statistics – Test of significance – Null hypothesis – Alternate hypothesis – Procedures in testing of hypothesis – errors in sampling critical region – level of significance**					
UNIT IV	**Test of significance of large sampling – Test of significance of single mean – Test of significance of difference between two means – test of significance of proportion – test of significance of difference between two proportions – test of significance of difference between two standard deviation**					
UNIT V	**Chi square test (definition) – chi square test for test of goodness of fit – independence of attributes – student's t – distribution (definition) – t-test for single mean – t- test for difference between two means – t–test for dependent sample – t-test for co-efficient of correlation**					
Prescribed Text(specify sections clearly)	*Fundamentals of Mathematical Statistics by S.C.Gupta, V.K.Kapoor, Sultan Chand and Sons , 11th edition* *Unit I : 10.1 to 10.6* *Unit II : 10.7* *Unit III : 12.1 to 12.7* *Unit IV : 12.8 – 12.15* *Unit V : 13.1, 13.7 , 14.1, 14.2*					
Recommended books	1. *Statistical methods by S.P.Gupta – Sultan Chand.* 2. *Statistics(Theory and Practice) by R.S.N.Pillai& V. Bagavathy - S.Chand& Co.*					
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*					

Degree	B.Sc	Branch	MATHEMATICS			
Year	III	Course Name	GE - 2		Theory	3
Semester	VI	Course Code	MATH 367	Credits	Tutorial	0
Paper Name	**NUMERICAL METHODS USING C**					
UNIT I	**Numerical solution of algebraic and transcendental equations – Bolzano's bisection method - Successive approximation method – Regula falsi method – Newton-Raphson method.**					
UNIT II	**Numerical solution of simultaneous linear algebraic equations – Gauss elimination method - Gauss Jordan elimination method – Gauss Seidel iteration method.**					
UNIT III	**Finite difference operator - Interpolation – Newton-Gregory forward and backward interpolation – Newton's divided difference formula – Lagrange's interpolation formula for uneven intervals – Gauss interpolation formula – Numerical differentiation – Numerical Integration – Trapezoidal rule – Simpson's 1/3rd rule.**					
UNIT IV	**Numerical solutions of Ordinary differential equations of first and second order – Simultaneous equations – Taylor series method – Picard's method.**					
UNIT V	**Euler's method – Improved Euler's Method - Modified Euler's Method – Runge-Kutta method of second and fourth order – Milne's predictor corrector method.**					
Prescribed Text(specify sections clearly)	*Numerical Method in Science and Engineering, M.K.Venkataraman, National Publication Co, Chennai(2001)* *Unit 1: Chapter 3 and 4* *Unit 2: Chapter 5* *Unit 3: Chapter 6 and 9* *Unit 4: Chapter 11 (Relevant portions)* *Unit 5: Chapter11 (Relevant portions)*					
Recommended books	*Computer oriented Numerical Methods by V. Rajaram – PHI(P) Ltd.*					
e-Learning Source	*http://ndl.iitkgp.ac.in* *http://ocw.mit.edu* *http://mathforum.org*					

QUESTION PAPER PATTERN

Total Mark :75   Time :3 Hours

Section A	Section B	Section C
Ten questions **10*2 = 20** **Two questions from each units**	**Five Questions** **5*5 = 25** Internal choice one set of questions from each units	**Three Questions** **3*10 = 30** 3 out of 5 questions (one question from each unit)

Section	No. of Questions	Allocation of questions	Choice type	Mark per Question	Total Marks
A	10	Two from each unit	No choice	2	10X2=20
B	5	One setfrom each unit	Either or type	5	5X5=25
C	5	One from each unit	3 out of 5	10	3X10=30