VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.

SYLLABUS FOR B.Sc. (MATHEMATICS)

Semester: V, VI

Effective from December 2013

Sem3ester	Paper	Name of the Paper	Hours	Credit	Marks
V	MTH-501	Group Theory	3	3	100 (30 Internal + 70 External)
	MTH-502	Linear Algebra - I	3	3	
	MTH-503	Real Analysis - I	3	3	
	MTH-504	Real Analysis - II	3	3	
	MTH-505	Graph Theory	3	3	
	MTH-506	Number Theory - I	3	3	
	EG	Operations Research - I	2	2	70 (20 Internal + 50 External)
		Mechanics - I			
		Computer Oriented Numerical Methods - I			
		Fourier Series			
VI	MTH-601	Ring Theory	3	3	100 (30 Internal + 70 External)
	MTH-602	Linear Algebra – II	3	3	
	MTH-603	Real Analysis - III	3	3	
	MTH-604	Real Analysis - IV	3	3	
	MTH-605	Discrete Mathematics	3	3	
	MTH-606	Number Theory - II	3	3	
	EG	Operations Research - II	2	2	70 (20 Internal + 50 External)
		Mechanics - II			
		Computer Oriented Numerical Methods - II			
		Fourier Transform and its Applications			

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER -V
MTH-501
(Group Theory)
Effective from December 2013
Marks:100 (30 internal+70 external)
(3 Hours / Week - Credits : 3)

Unit 1:
Divisors, Greatest common divisor, Least Common multiple, Prime numbers, Fundamental theorem of Arithmetic, Congruence relation, Equivalence classes.

Unit 2:
Definition & examples of groups, Elementary properties of a group, finite group and their tables, Subgroups.

Unit 3:
Cyclic groups, Order of an element, Cosets, Lagrange's theorem, Euler's theorem, Fermat's theorem, counting principle.

Unit 4:
Normal subgroups & Quotient groups, Homomorphism, Isomorphism, Isomorphic groups, fundamental theorem of homomorphism.

The course is covered by the following reference books :

1. I. N. Herstein : Topics in Algebra, Wiley Eastern Ltd. New Delhi, 1983.
2 I. H. Sheth : Abstract Algebra, NiravPrakashan, Ahmedabad.
3. N. S. GopalKrishnan : University Algebra, Wiley Eastern Ltd.
4. P. R. Bhattacharya, S. K. Jain and S. R. Nagpaul : Basic Abstract Algebra, Cambridge University Press, Indian Edition, 1997.
5. Shantinarayan :Modern Algebra, S. Chand & Co.
6. Serge Lang : Algebra, ed. Addition Wesley, 1993.
7. Surjeet&KaziZameeruddin : Modern Algebra, Vikas Publishing House.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - V
MTH-502
(Linear Algebra - I)
Effective from December 2013
Marks:100 (30 internal+70 external)
(3 Hours / Week - Credits : 3)

Unit 1:
Definition and examples of Vector space, Subspace, Necessary and sufficient condition for a subspace, Illustrations.

Unit 2:
Span of a set, union and intersection of subspaces, sum and direct sum of subspaces.

Unit 3:
Linearly dependent and independent vectors, checking of Linear dependence or independence.

Unit 4:
Dimension and Basis of a vector space, extension of a linearly independent set to a basis, dimension of sum.

The course is covered by the following reference books :
1. V. Krishnamurthy, V. P. Mainra& J. L. Arora : An Introduction to Linear Algebra, Affiliated East-West Press Pvt. Ltd., New Delhi.
2. I. H. Sheth : Linear Algebra, NiravPrakashan.
3. S. Kumaresan : Linear Algebra, Prentice Hall of India, 2000.
4. Serge Lang : Linear Algebra, Addition-Wesley Pub. Co. (Student Ed.).
5. Balakrishnan : Linear Algebra, Tata-McGraw Hill Ed.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - V
MTH-503
(Real Analysis - I)
Effective from December 2013
Marks:100 (30 internal+70 external)
(3 Hours / Week - Credits : 3)

Unit 1:
Countable & uncountable sets, greatest lower bound and least upper bound.

Unit 2:
Sequences of real numbers, sub-sequences, limit of a sequence, convergent sequences, divergent sequences.

Unit 3:
Bounded sequences, monotone sequences, operations on convergent sequences.

Unit 4:
Operations on divergent sequences, concepts of limit superior and inferior, Cauchy sequence.

The course is covered by the following reference books:

1. R. R. Goldberg : Methods of Real Analysis, Oxford & TBH Pub. Co.
2. T. M. Apostol : Mathematical Analysis, Narosa Publishing House, New Delhi.
3. S. C. Malik : Real Analysis, Wiley-Eastern Pub. Co., New Delhi.
4. Walter Rudin : Principles of Mathematical Analysis, McGraw Hill book Company.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - V
MTH-504
(Real Analysis - II)
Effective from December 2013
Marks:100 (30 internal+70 external)
(3 Hours / Week - Credits : 3)

Unit 1:
Revision of Limit and Continuity of a function on the real line, Definition & examples of Metric spaces.

Unit 2:
Limit, Convergence and Cauchy sequence in metric space, Equivalent metrics.

Unit 3:
Open ball in R^1, open ball in metric space, functions continuous on metric spaces.

Unit 4: Open sets, more about open sets.

The course is covered by the following reference books:

1. R. R. Goldberg : Method of Real Analysis, Oxford & IBH Pub. Co. Ltd. New Delhi.
2. T. M. Apostol : Mathematical Analysis, Narosa Publishing House, New Delhi, 1985.
3. S. Lang : Undergraduate Analysis, Springer-Verlag, New York, 1983.
4. D. SomSundaram& B. Chaudhari : A first course in Mathematical Analysis, Narosa Publishing House, New Delhi, 1997.
5. P. K. Jain & S. K. Kaushik : An Introduction to Real Analysis, S. Chand & Co. New Delhi, 2000.
6. E. T. Copson : Metric Spaces, Cambridge University Press, 1968.
7. P. K. Jain & K. Ahmed : Metric Spaces, Narosa Pub. House, New Delhi, 1996.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - V
MTH-505
(Graph Theory)
Effective from December 2013
Marks:100 (30 internal+70 external)
(3 Hours / Week - Credits : 3)

Unit 1:
Graphs, applications and various type of graphs, incidence and degree, isolated and pendent vertices.

Unit 2:
Subgraphs, Operations on graphs, Isomorphism between two graphs, Walks, Paths, Circuits.

Unit 3:
Connected graphs, Disconnected graphs, Components of graphs, Euler graphs, Hamiltonian graphs.

Unit 4:
Trees, Properties of trees, Pendent vertices in a tree, Distance between two vertices, Centre, Radius and Diameter of a Tree, Rooted & Binary trees.

The course is covered by the following reference books:

1. NarsinghDeo : Graph Theory with applications to Engineering & Computer Science, Prentice Hall of India Pvt. Ltd., 2000.
2. R. J. Wilson : Introduction to Graph Theory, Academic Press, New York, 1972.
3. E. Harray : Graph Theory, Addison Wesley Pub. Co., 1969.
4. C. Berge : The Theory of Graphs and its Applications, John Wiley & Sons, 1962.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - V
MTH-506
(Number Theory - I)
Effective from December 2013
Marks:100 (30 internal+70 external)
(3 Hours / Week - Credits : 3)

Unit 1:
Divisibility of integers, the Division Algorithm, Greatest Common Divisor of two integers, the Euclidean algorithm, relation between greatest common divisor and least common multiple of two integers.

Unit 2:
Computation of the solutions of linear Diophantine equations in two variables, Primes and composite numbers, the fundamental theorem of arithmetic, Pythagorean theorem for the irrationality of $\sqrt{2}$.

Unit 3: Sieve of Eratosthenes, infinitude of primes, upper bound for the primes, Theory of Congruences.

Unit 4: Basic properties of Congruence, divisibility tests of 9 and 11.

The course is covered by the following reference books :
1. David M. Burton : Elementary Number Theory, Tata McGraw-Hill Pub. Co. Ltd., New Delhi, 6th Ed., 2006.
2. S. G. Telang : Number Theory, The Tata McGraw Hill Co. Ltd., New Delhi.
3. I. Niven, S. Zuckerman & L. Montgomery: An Introduction to Theory of Numbers, John Wiley, 1991.
4. George Andrews : Number Theory, The Hindustan Pub. Corporation, New Delhi.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - V
Elective Generic
(Operations Research-I)
Effective from December 2013
Marks:70 (20 internal+ 50 external)
(2 Hours / Week - Credits : 2)

Unit 1:
GraphicalSolution of Linear programming problem (LPP).
Definition of the dual problem, General rules for converting any primal problem into it's dual, The symmetric dual problems.

Unit 2:
Basic concept of basic, non-basic, degenerate, non-degenerate and basic feasible solutions of LPP, slack & surplus variables, LPP in the standard matrix form, Slack & surplus variables, Solution of LPP using Simplex method.

Unit 3:
Solution of LPP using Two Phase Simplex method and Big-M method.

The course is covered by the following reference books:
1. J. K. Sharma : Operations Research: Theory & Applications, McMillan India Ltd., 1998.
2. KantiSwaroop, P. K. Gupta & Man Mohan : Operations Research, S. Chand & Sons, New Delhi, 1998.
3. G. Hadley : Linear Programming, Narosa Publishing House, New Delhi, 1995.
4. S. D. Sharma: Operations Research, KedarnathRamnath& Co.
5. P. M. Karak : Linear Programming, New Central Book Agency Pvt. Ltd. Calcutta - 9.
6. K. V. Mittal & L. Mohan : Optimization methods in O.R. and System Analysis, New Age International Publications.
7. Goel&Mittal : O.R., PragatiPrakashan, Meerut.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - V
Elective Generic
(Mechanics-I)
Effective from December 2013
Marks:70 (20 internal+ 50 external)
(2 Hours / Week - Credits : 2)

Unit 1:
Methods of plane statics, triangle of.forces, Lamy's theorem, work and potential energy, forces which do no work, virtual work, Infinitesimal displacement of a rigid body parallel to a fixed plane.

Unit 2:
Sufficient condition for the equilibrium of a rigid body moving parallel to a fixed plane, potential energy, mass centre, methods of decomposition and symmetries for finding mass centre of a rigid body.

Unit 3:
Pappus' theorems, Gravitational forces, Laws of friction, Flexible Cable, Suspension bridge, Equation of common catenary.

The course is covered by the following reference books:
1. Synge &Grifith: Principles of Mathematics, McGraw Hill Book Co.
2. A. G. Takwal& P. S. Puranil: Introduction to Classical Mechanics,
Tata McGraw Hill.
3. S. L. Loney : Statics, SurjeetPrakashan.
4. S. L. Loney : Dynamics, SurjeetPrakashan.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - V
Elective Generic
(Computer Oriented Numerical Methods – I)
Effective from December 2013
Marks:70 (20 internal+ 50 external)
(2 Hours / Week - Credits : 2)

Unit 1:

Flow charts and symbols, More flow charting examples.

FORTRAN language, character used in FORTRAN, FORTRAN constants, FORTRAN variable names, Type declaration for integer and real, Arithmetic expression (real and integer expressions), Hierarchy of operations in expressions, Examples of Arithmetic expression.

Unit 2:

Arithmetic statement, Mode of Arithmetic expression, Special function, examples of use of functions, Program preparation preliminaries.

Unit 3:

Input-Output statement, STOP and END statement, FORTRAN coding form, Simple FORTRAN program, FORTRAN programming examples.

The course is covered by the following reference books:

1. V. Rajaraman : Computer Programming in FORTRAN 77, PHI.
2. V. Rajaraman : Computer Oriented Numerical Methods, PHI.
3. Dhaliwal, Agarwal and Gupta : Programming with FORTRAN 77, Wiley Eastern Ltd.
4. R. S. Salaria : Computer Oriented Numerical Methods, Khanna Book Pub. Co. Ltd.
5. R. Sirkar : FORTRAN based Algorithms, New Central Book Agency, Calcutta.
6. V. Krishnamurthy : FORTRAN based Algorithms, East-West Press, N.Delhi.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - V
Elective Generic
(Fourier Series)
Effective from December 2013
Marks:70 (20 internal+ 50 external)
(2 Hours / Week - Credits : 2)

Unit 1:
Definition of Fourier series, Euler's formulae, Evaluation of definite integrals, Conditions for a Fourier expansion.

Unit 2:
Functions having points of discontinuity, change in intervals, even and odd functions, Expansion of even or odd periodic functions.

Unit 3:
Half range series, Typical waveforms, Parseval's formula, Root mean square value, Complex form of Fourier series.

The course is covered by the following reference books:

1. B. S. Grewal : Higher Engineering Mathematics, KhannaPrakashan, New Delhi.
2. S. K. Jain : Fourier series and Fourier Transforms, Swarup and Sons Pub., New Delhi.
3. R. R. Goldberg : Method of Real Analysis, Oxford & IBH Pub. Co. Ltd. New Delhi.
4. R. V. Churchil : Fourier series and Boundary value problems, McGraw Hill ISE.
5. Vashishtha and Gupta :Integral Transforms, Krishna Publications, Meerut.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - VI
MTH-601
(Ring Theory)
Effective from December 2013
Marks:100 (30 internal+70 external)
(3 Hours / Week - Credits : 3)

Unit 1:
Definition & examples of Ring, Integral Domain and Field, Characteristic of an Integral Domain.

Unit 2:
Ring Homomorphism and Isomorphism, Ideals & Quotient rings, Maximal Ideal, Principal Ideal.

Unit 3:
Euclidean rings, divisibility in commutative ring, gcd of two elements in a ring, units and associates in rings.

Unit 4:
Prime element in a Euclidean Ring, Unique factorization theorem in a Euclidean ring.

The course is covered by the following reference books :

1. I. N. Herstein : Topics in Algebra, Wiley Eastern Ltd. New Delhi, 1983.
2 I. H. Sheth : Abstract Algebra, NiravPrakashan, Ahmedabad.
3. N. S. GopalKrishnan : University Algebra, Wiley Eastern Ltd.
4. P. R. Bhattacharya, S. K. Jain and S. R. Nagpaul : Basic Abstract Algebra, Cambridge University Press, Indian Edition, 1997.
5. Shantinarayan :Modern Algebra, S. Chand & Co.
6. Serge Lang : Algebra, ed. Addition Wesley, 1993.
7. Surjeet&KaziZameeruddin : Modern Algebra, Vikas Publishing House.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - VI
MTH-602
(Linear Algebra – II)
Effective from December 2013
Marks:100 (30 internal+70 external)
(3 Hours / Week - Credits : 3)

Unit 1:
Definition and examples of Linear transformation, Range and kernel of a linear transformation.

Unit 2:
Rank-Nullity Theorem, Inverse of a linear transformation, Consequences of Rank-Nullity Theorem, Composition of linear transformations.

Unit 3:
Matrix associated with linear transformations, linear transformation associated with a matrix, Application of Rank-Nullity Theorem for matrix.

Unit 4:
Inner product spaces, Norm of a vector, Cauchy-Schwarz's inequality, Triangular inequality, Orthogonal vectors.

The course is covered by the following reference books :
1. V. Krishnamurthy, V. P. Mainra& J. L. Arora : An Introduction to Linear Algebra, Affiliated East-West Press Pvt. Ltd., New Delhi.
2. I. H. Sheth : Linear Algebra, NiravPrakashan.
3. S. Kumaresan : Linear Algebra, Prentice Hall of India, 2000.
4. Serge Lang : Linear Algebra, Addition-Wesley Pub. Co. (Student Ed.).
5. Balakrishnan : Linear Algebra, Tata-McGraw Hill Ed.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - VI
MTH-603
(Real Analysis – III)
Effective from December 2013
Marks:100 (30 internal+70 external)
(3 Hours / Week - Credits : 3)

Unit 1:
Convergence and divergence of series of real numbers, Series with non-negative terms, Alternating series, Conditional and absolute convergence.

Unit 2:
Tests for absolute convergence, Series whose terms form a non-increasing sequence.

Unit 3:
Sets of measure zero, definition of the Riemann Integral, properties of Riemann Integral.

Unit 4: Fundamental theorems of Integral Calculus, Mean-value Theorems of Integral Calculus.

The course is covered by the following reference books:

1. R. R. Goldberg : Method of Real Analysis, Oxford & IBH Pub. Co. Ltd., New Delhi.
2. T. M. Apostol : Mathematical Analysis, Narosa Publishing House, New Delhi, 1985.
3. S. Lang : Undergraduate Analysis, Springer-Verlag, New York, 1983.
4. Louis Leithold : Calculus with analytic Geometry, Harper and Collins Pub. Co.
5. J. B. Thomas and Finney : Calculus with analytic Geometry.
6. E. T. Copson : Metric Spaces, Cambridge University Press, 1968.
7. P. K. Jain & K. Ahmed : Metric Spaces, Narosa Pub. House, New Delhi, 1996.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - VI
MTH-604
(Real Analysis – IV)
Effective from December 2013
Marks:100 (30 internal+70 external)
(3 Hours / Week - Credits : 3)

Unit 1:
Limit points, closure of a set, closed sets, homeomorphism of metric spaces, dense set.

Unit 2:
Connected sets, Bounded sets, Totally bounded sets.

Unit 3:
Complete metric spaces, Contraction mapping, Picard's fixed point theorem.

Unit 4:
Compact metric spaces, Open covering, Heine-Borel property, Finite Intersection property.

The course is covered by the following reference books:

1. R. R. Goldberg : Method of Real Analysis, Oxford & IBH Pub. Co. Ltd., New Delhi.
2. T. M. Apostol : Mathematical Analysis, Narosa Publishing House, New Delhi, 1985.
3. S. Lang : Undergraduate Analysis, Springer-Verlag, New York, 1983.
4. S. C. Malik : Real Analysis, Wiley-Eastern Pub. Co., New Delhi.
5. Walter Rudin : Principles of Mathematical Analysis, McGraw Hill book Company.
6. Copson : Metric Spaces, Cambridge University Press, 1968.
7. P. K. Jain & K. Ahmed : Metric Spaces, Narosa Pub. House, New Delhi, 1996.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - VI
MTH-605
(Discrete Mathematics)
Effective from December 2013
Marks:100 (30 internal+70 external)
(3 Hours / Week - Credits : 3)

Unit 1:
Binary relations, Properties of binary relations, Equivalence relation, Partial ordered relation, Partially ordered sets, Upper bounds, Lower bounds, GLB & LUB of sets, Totally ordered sets, Well ordered sets, Hasse Diagram, Lattices and its properties.

Unit 2:
Lattices as algebraic systems, Lattice homomorphism, Different types of lattices.

Unit 3:
Boolean Algebra as an algebraic system, Boolean expressions (forms), Different representation of Boolean forms, Sum of products canonical form and product of sums canonical forms of Boolean expressions.

Unit 4:
Minimization of Boolean functions by Karnaugh Map method and Quine-McCluskey algorithm, AND, OR & NOT gates, Reduction of switching circuit diagram.

The course is covered by the following reference books:

1. J. P. Tremblay & R. Manohar : Discrete mathematical Structures with Applications to Computer Science., McGraw Hill Book Co., 1999.
2. B. Kolman, R. C. Busby & S. Ross : Discrete Mathematical Structures, Prentice Hall of India Pvt. Ltd., 3rd ed. 2001.
3. Elements of Discrete Mathematics, C. L. Liu, D. P. Mohapatra, Tata McGraw Hill, 2008.
4. Discrete Mathematics with Applications, Thomas Koshy, Academic Press, 2004.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - VI
MTH-606
(Number Theory – II)
Effective from December 2013
Marks:100 (30 internal+70 external)
(3 Hours / Week - Credits : 3)

Unit 1:
Computation of the solutions of linear congruence , the Chinese Remainder Theorem.

Unit 2:
Fermat's little theorem, Pseudo-primes, Wilson's theorem.

Unit 3:
The number of positive divisors and sum of all positive divisors of an integer, basic properties and multiplicative nature of these functions, The Möbius Inversion formula (without proof), the greatest integer function.

Unit 4:
Introduction of Euler's Phi-function , multiplicative nature of (statement only), Euler's Theorem.

The course is covered by the following reference books :
1. David M. Burton : Elementary Number Theory, Tata McGraw-Hill Pub. Co. Ltd., New Delhi, 6th Ed., 2006.
2. S. G. Telang : Number Theory, The Tata McGraw Hill Co. Ltd., New Delhi.
3. I. Niven, S. Zuckerman & L. Montgomery: An Introduction to Theory of Numbers, John Wiley, 1991.
4. George Andrews : Number Theory, The Hindustan Pub. Corporation, New Delhi.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - VI
Elective Generic
(Operations Research-II)
Effective from December 2013
Marks:70 (20 internal+ 50 external)
(2 Hours / Week - Credits : 2)

Unit 1:
Assignment problems, The Hungarian method, balanced & unbalance assignment problems.

Unit 2:
Transportation problem, methods for finding initial basic feasible solution, solution of Transportation problem by MODI method, Unbalanced Transportation problem.

Unit 3:
Competitive games, two-person zero-sum game, maximin and minimax principle, saddle points and the value of the game (based on pure strategies), mixed strategies, solution of games with saddle point, solution of $m\times2$ and $2\times n$ games using graphical method.

The course is covered by the following reference books:
1. J. K. Sharma : Operations Research: Theory & Applications, McMillan India Ltd., 1998.
2. KantiSwaroop, P. K. Gupta & Man Mohan : Operations Research, S. Chand & Sons, New Delhi, 1998.
3. G. Hadley : Linear Programming, Narosa Publishing House, New Delhi, 1995.
4. S. D. Sharma: Operations Research, KedarnathRamnath& Co.
5. P. M. Karak : Linear Programming, New Central Book Agency Pvt. Ltd. Calcutta - 9.
6. K. V. Mittal & L. Mohan : Optimization methods in O.R. and System Analysis, New Age International Publications.
7. Goel&Mittal : O.R., PragatiPrakashan, Meerut.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - VI
Elective Generic
(Mechanics – II)
Effective from December 2013
Marks:70 (20 internal+ 50 external)
(2 Hours / Week - Credits : 2)

Unit 1:
Plane Kinematics, Tangential & Normal components of velocity and acceleration, Radial and Transverse components of velocity & acceleration, Hodograph.

Unit 2:
Methods of plane dynamics, Motion of a particle, Linear and angular momentum of a particle and a system of particles, Principle of Conservation of Energy.

Unit 3:
Application in plane dynamics, Projectile without resistance, Parabolic trajectory, Limits of range of trajectory, The Harmonic Oscillator, Simple Pendulum.

The course is covered by the following referencebooks :

1. Synge &Grifith: Principles of Mathematics, McGraw Hill Book Co.
2. A. G. Takwal& P. S. Puranil: Introduction to Classical Mechanics, Tata McGraw Hill.
3. A. S. Ramsey : Statics, Cambridge University Press.
4. A. S. Ramsey : Dynamics, Cambridge University Press.
5. R. I. Steins : Mechanics, Berncs&Nibweinc.
6. S. L. Loney : Statics, SurjeetPrakashan.
7. S. L. Loney : Dynamics, SurjeetPrakashan.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - VI
Elective Generic
(Computer Oriented Numerical Methods – II)
Effective from December 2013
Marks:70 (20 internal+ 50 external)
(2 Hours / Week - Credits : 2)

Unit 1:
Control statements, Relational operators, Logical IF statement, Arithmetic IF statement, Block IF statement.

Unit 2:
Statement labels, GO TO statement, Example of use of Logical IF statement, Nested logical IF statement, Computed GO TO statement, DO statement, Examples of DO statement.

Unit 3:
Rules to be followed in utilizing DO loops, Subscripted variables, Subscripted expression, Dimension statement, DO type notation for input / output statement. FORMAT specification and FORMAT specification for a numerical data.

The course is covered by the following reference books:

1. V. Rajaraman : Computer Programming in FORTRAN 77, PHI.
2. V. Rajaraman : Computer Oriented Numerical Methods, PHI.
3. Dhaliwal, Agarwal and Gupta : Programming with FORTRAN 77, Wiley Eastern Ltd.
4. R. S. Salaria : Computer Oriented Numerical Methods, Khanna Book Pub. Co. Ltd.
5. R. Sirkar : FORTRAN based Algorithms, New Central Book Agency, Calcutta.
6. V. Krishnamurthy : FORTRAN based Algorithms, East-West Press, N. Delhi.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER - VI
Elective Generic
(Fourier Transform and its Applications)
Effective from December 2013
Marks:70 (20 internal+ 50 external)
(2 Hours / Week - Credits : 2)

Unit 1:
Integral transforms, Fourier Transforms, Properties of Fourier Transform and its application.

Unit 2:
Convolution, Convolution theorem for Fourier transforms, Parseval's Identity for Fourier transform.

Unit 3:
Relation between Fourier and Laplace Transforms, Fourier transforms of the derivatives of a function, Fourier transform and its applications.

The course is covered by the following reference books :

1. B. S. Grewal : Higher Engineering Mathematics, KhannaPrakashan, New Delhi.
2. S. K. Jain : Fourier series and Fourier Transforms, Swarup and Sons Pub., New Delhi-110002.
3. R. R. Goldberg : Method of Real Analysis, Oxford & IBH Pub. Co. Ltd. New Delhi.
4. R. V. Churchil : Fourier series and Boundary value problems, McGraw Hill ISE.
5. Vashishtha and Gupta :Integral Transforms, Krishna Publications, Meerut