

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc. (MATHEMATICS for Computer Science)

SEMESTER - III

MCS - 301

(Advanced Calculus - II)

Effective from July 2015

Marks: 100 (30 internal + 70 external)

(3 Hours/ Week - Credits : 3)

Unit I:

Sequence, convergent sequence, limit of a sequence, bounded sequence, monotone sequence, series, convergent, divergent and oscillatory series, necessary conditions for convergent series, test of convergence of series by p series method, Ratio test.

Unit II:

Partial derivatives, limit, continuity of functions of two variables, homogeneous function, Euler's Theorem for homogeneous functions, total differentiation, Maxima-Minima (Only applications), Taylor's theorem for functions of two variables (Only applications)

Unit III:

Double Integrals, Change of order of Double integrals, Area.

Unit IV:

Beta-Gamma functions, Properties, Relation between Beta and Gamma functions, Applications of Beta-Gamma function.

The course is covered by the following reference books :

1. Shantinayyan : Differential Calculus, S. Chand & Co., New Delhi.
2. Sharma & et al : Advanced Differential Calculus, Krishna Prakashan Media, Meerut.
3. N. P. Bhamore & et al : Mathematics Paper III-IV, Popular Prakashan, Surat.
4. H. K. Dass : Advanced Engineering Mathematics, S. Chand & Company, N.Delhi

Praveen Deep
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SYLLABUS FOR B.Sc. (MATHEMATICS for Computer Science)

SEMESTER - III

MCS - 302

(Discrete Mathematics - I)

Effective from July 2015

Marks:100 (30 internal + 70 external)

(3 Hours / Week - Credits : 3)

Unit 1:

Basic concepts of divisibility, Computation of the Greatest Common Divisor using the Euclidean Algorithm, Computation of the solutions of linear Diophantine equations in two variables.

Prime numbers, The Fundamental theorem of Arithmetic [without proof], Infinitude of primes.

Unit 2:

Recurrence relations, Recurrence relation models viz. Fibonacci sequence, Tower of Hanoi, Generating function, solution of recurrence relation using generating functions.

Unit 3:

Function, Types of function, Recursively defined function, some special functions (Floor and ceiling function, Mod and Div function, Injective or surjective on Mod function, Hamming distance function, Characteristics function), Algebra of characteristics function.

Unit 4:

Groupoid, semigroup and monoid, Group, sub-group, cyclic group, permutation group, Homomorphism and Isomorphism of groups.

The course is covered by the following reference books :

1. David M. Burton : Elementary Number Theory, McGraw Hill Edu (India) Pvt. Ltd., N. Delhi, 7th Ed., 2012.
2. A textbook of Discrete Mathematics: S. K. Sarkar, S. Chand & Company Ltd.
3. Foundations of Discrete Mathematics: K. D. Joshi, Wiley Eastern Limited.
4. Discrete Mathematical structures: Bernard Kolman, Robert C. Busby, Sharon Ross, Prentice- Hall of India.
5. Discrete Mathematics: Richard Johnson baugh Macmillan Publishing Company.
6. Discrete Mathematics: Harikishan, Shivraj Pundir, Sandeep Kumar, Pragati Prakashan, Meerut.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR B.Sc. (MATHEMATICS for Computer Science)
SEMESTER - III

MCS - 303

(Differential Equations - I)

Effective from July 2015

Marks: 100 (30 internal + 70 external)

(3 Hours / Week - Credits : 3)

Unit 1:

Linear Differential Equations with constant coefficients, Complimentary functions, Particular Integral, General solution, Methods for finding Particular Integral.

Unit 2:

Linear Differential Equations with variable coefficients, Homogeneous Differential Equations.

Unit 3:

Laplace Transform, Laplace transform of standard functions like e^x , $\sin x$, $\cos x$, x^n , $\sinh x$, $\cosh x$ etc, first shifting theorem, second shifting theorem, change of scale property.

Unit 4:

Inverse Laplace Transform, inverse Laplace transform of standard functions, first shifting theorem, second shifting theorem, change of scale property for inverse Laplace transforms.

Application of Laplace transformation for solving ordinary differential equations with constant coefficients.

The course is covered by the following reference books :

1. D. A. Murray : An Introductory Course in Differential Equations, Orient Longmans, Bombay.
2. N. P. Bhamore & et al. : Mathematics Paper-III-IV, Popular Prakashan, Surat.
3. S. L. Ross : Differential equations, John Wiley and Sons., 1984.
4. Nita H. Shah : Ordinary and Partial Differential Equations : Theory and Applications, PHI Learning Pvt. Ltd, New Delhi.
5. Gorakhprasad : Differential Equations, Pothishala Pvt. Ltd., Allahabad.
6. Shantinakaran & P. K. Mittal : A course of Mathematical Analysis, S. Chand and Co., New Delhi.

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