VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
SYLLABUS FOR B. Sc. (MATHEMATICS)
SEMESTER -IV
MTH-401
(Mathematics-VIII)
Effective from June 2021
Marks:70 (20 internal + 50 external)
(3 Hours / Week - Credits: 3)

Unit I:

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

Unit II:

Double and Triple Integrals: Change of order of Double integrals, Area.

Unit III:

Laplace Transforms: Laplace Transform of elementary functions, Properties of Laplace Transform, Differentiation and Integration of Laplace Transform, Laplace Transform of derivatives and integrals.

Unit IV:

Inverse of Laplace Transform: Method of Partial fractions, Properties of inverse Laplace Transform.

The course is covered by the following reference books:

1. David V. Widder : Advanced Calculus, PHI Learning Pvt. Ltd, New Delhi
2. Kreysig: Advanced Engineering Mathematics, John Wiley, New York, 1999.
3. Shantinarayan, P. K. Mittal : A course of Mathematical Analysis, S. Chand and Co., New Delhi.
4. N. P. Bhamore & et al : Mathematics Paper III-IV, Popular Prakashan, Surat.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
SYLLABUS FOR B. Sc. (MATHEMATICS)
SEMESTER -IV
MTH-402
(Mathematics-IX)*
Effective from June 2021
Marks:70 (20 internal + 50 external)
(3 Hours / Week - Credits: 3)

Unit I:
Finite difference with unequal interval, Lagrange's Interpolation Formula, Divided Differences, Newton's General Interpolation Formula.

Unit II:
Numerical Differentiation: 1^{st} and 2^{nd} order derivatives based on Newton's forward and backward difference interpolation formulae.

Unit III:
Numerical Integration: General Integration formula, Trapezoidal Rule, Simpson's 1/3-Rule, Simpson's 3/8-Rule.

Unit IV:
Solution of Ordinary Differential Equations by Taylor's series method, Picard's approximation method, Euler's method.

The course is covered by the following reference books:

1. S. S. Sastry : Introductory methods of Numerical Analysis, Prentice-Hall of India Pvt. Ltd.; 4^{th} Edition.
2. M. K. Jain, Iyenger, Jain: Numerical Methods for Scientific and Engineering Computations, New Age International Ltd.
3. Goel, Mittal : Numerical Analysis, Pragati Prakashan, Meerut.
4. Kaiser A. Kunz : Numerical Analysis, McGraw Hill Book Co., London.
5. James I. Buchanan, Peter R. Turner: Numerical Methods and Analysis, McGraw Hill Book Co., London.

* Use of Scientific non – programmable calculator is permitted.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
SYLLABUS FOR B. Sc. (MATHEMATICS)
SEMESTER -IV
MTH-403
(Mathematics-X)
Effective from June 2021
Marks:70 (20 internal + 50 external)
(3 Hours / Week - Credits: 3)

Unit I:
Sets and elements, Operations on sets, Functions, Real-valued functions.

Unit II:
Countable & Uncountable sets, Greatest lower bound and least upper bound.

Unit III:
Sequences of real numbers, Sub-sequences, limit of a sequence, Convergent sequences, Divergent sequences.

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

The course is covered by the following reference books :

1. R. R. Goldberg : Methods of Real Analysis, Oxford & TBH Pub. Co.
2. I. N. Herstein : Topics in Algebra, Wiley Eastern Ltd., New Delhi, 2006.
3. I. H. Sheth : Abstract Algebra, Nirav Prakashan, Ahmedabad.
4. T. M. Apostol : Mathematical Analysis, Narosa Publishing House, New Delhi.
5. S. C. Malik : Mathematical Analysis, Wiley-Eastern Ltd, New Delhi.
6. Shantinarayan : Modern Algebra, S. Chand and Co., New Delhi.