SYLLABUS M.SC MATHEMATICS – III SEMESTER
FUNCTIONAL ANALYSIS -I
MAT-301

Unit- I

Normed linear spaces, Banach spaces and its examples, Properties of Normed linear spaces, Basic properties of finite dimensional Normed linear spaces.

Unit- II

Finite Dimensional non linear spaces and Sub spaces equivalent norms, Riesz lemma and compactness.

Unit- III

Quotient space of Normed linear spaces and its completeness.

Unit- IV

Bounded linear operators and Continuous operators, Non - Linear spaces operators.

Unit- V

Linear functional, Bounded linear functional dual spaces with examples.

Text Books:-

1. E. Kreyszig, Introductory Functional Analysis with application, John Wiley and Sons New York.
2. G.F. Simmons, Introduction to Topology & Modern Analysis McGraw Hill, New York.

Reference:-

1. B. Choudary and Sudarshan Nanda. Functional Analysis with application Wiley Eastern Ltd.

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SYLLABUS M.SC MATHEMATICS – III SEMESTER

Advanced Special Function -I

MAT-302

Unit- I

Gamma and Beta Function: The Euler or Mascheroni Constant Y, Gamma Function a series for $\Gamma'(z)/\Gamma(z)$, Difference equation $\Gamma(z+1) = z\Gamma(z)$, value of $\Gamma z / \Gamma(1-z)$, Factorial function, Legender's Duplication formula, Gauss multiplication theorem.

Unit- II

Hypergeometric function and Function $2f.1\ (a,b;c;z)$**,** A simple integral form valuation of $2f.1\ (a,b;c;z)$, Contiguous function relations, Hyper geometric differential equation and its solutions, $F\ (a,b;c;z)$ as function of its parameters.

Unit- III

Generalized Hypergeometric Function.

Unit- IV

Elementary series manipulations, Simple transformation, Relations between function of z and $1-z$.

Unit- V

Confluent Hypergeometric Function and its properties.

Books :-

1. Rainville E. D., Special Functions, the Macmillan Co., New York 1971.
2. Srivatava H.M., Gupta K.C. and Goyal S.P., The H- Functions of one and two variables with applications, South Asian Publication, New Delhi.
3. Saran N., Sharma S.D. and Trivedi , Special Function with application, Pragati Prakashan 1986.
4. The Saxena V.P., I-Function, Anamaya New Delhi, 2008.

Reference Books:-

1. Lebdev N.N., Sepcial Functions and Their Applications, Prentice Hall Englewood Cliffs, New Jersey, USA 1995.
2. Whittaker E.T. and Watson G.N., A Course of Modern Analysis, Cambridge University Press, London, 1963.

SYLLABUS M.SC MATHEMATICS – III SEMESTER
Theory of Linear Operators -I
MAT-303

UNIT-I

Spectral theory in Normed linear spaces, Resolvent Set and Spectrum.

UNIT-II

Spectral properties of bounded linear operators.

UNIT-III

Properties of resolvent and spectrum, Spectral mapping theorem for polynomials.

UNIT-IV

Spectral radius of a bounded linear operator on a complex banach space, Elementary theory of Banach algebras.

UNIT-V

General properties if compact linear operators.

Books :-

1. E. Kreyszig, Introductory Functional Analysis with application, John Wiley and Sons New York.

Reference Book:-

1. P.R. Halmos, Introduction to Hilbert space and the theory of Spectral Multiplicity, Second edition, Chelsea publishing co. N. Y. 1957.
2. N. Dundford and J.T. Schwartz, linear operator-3 part, Inter science/ Wiley, New York 1958-1971.
3. G. Bachman and L. Narci, Functional analysis, Academic press New York. 1966.

SYLLABUS M.SC MATHEMATICS – III SEMESTER

Integral Transforms -I

MAT-304

UNIT-I

Laplace Transforms.

UNIT-II

Laplace's equations.

UNIT-III

Laplace's Wave equations.

UNIT-IV

Application of Laplace Transforms.

UNIT-V

Heat conduction equations.

Books :-

1. L. K. Vashisht ,Integral Transform, Krishna's Educational Publisher's India.

Recommended Books :-

1. J. K. Goyal and Gupta ,Integral Transform, Pragati Prakashan India.

SYLLABUS M.SC MATHEMATICS – III SEMESTER
Spherical Trigonometry and Astronomy-I
MAT-305

UNIT-I

Fundamental of Spherical Trigonometry.

UNIT-II

Solution of right angled triangle.

UNIT-III

Properties of Right angle triangle.

UNIT-IV

Relation between Sides and angles of a Spherical triangle.

UNIT-V

Application of Spherical triangle & Examples.

Books :-

1. W. M. Smart ,Textbook on Spherical Astronomy, Cambridge University Press.

Recommended Books :-

1. G. S. Malik , Spherical Astronomy, Kedar Nath Ram Nath Publication India .