NATIONAL INSTITUTE OF TECHNOLOGY SIKKIM

SEMESTER- III

Course Code: MA13102/ME13102 (CE/ME)

L	T	P	C
3	1	0	4

Course Title: Mathematics-III (CE/ME)

Module I: Complex Analysis

Complex functions, Derivative, Analytic function, Cauchy- Reimann equations, Line integral in the Complex plane, Cauchy's Integral Theorem, Cauchy's Integral formula, Derivatives of analytic functions. Taylor series and Maclaurin's series, Laurent's series, Singularities, Zeros and Residue. **12**

Module II: Matrix Theory

Types of matrices, Complex matrices, Characteristic polynomials, Eigen value, Eigen Vector, Caley-Hamillton theorem and its applications, Reduction to diagonal form, Linear transformation , . **9**

Module III: Optimization Techniques

Introduction to Linear Programming Model, Graphical method, Simplex Method, Nonlinear Optimization, Lagrange Method. **9**

Module IV: Statistics

Definitions of random sample, parameter and statistic, sampling distribution of a statistic, sampling distribution of sample mean, standard errors of sample mean, sample variance and sample proportion. Null and alternative hypotheses, level of significance, Type I and Type II errors, their probabilities and critical region. Large sample tests, use of CLT for testing single proportion, difference of two proportions, single mean, difference of two means. **10**

Text Books:

1. S.C. Gupta & V. K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand & Sons, 11th edn. New Delhi-2011
2. J. W. Brown and R.V. Churchill, Complex Variables and Applications, 7th edn., Mc-Graw Hill, 2004.
3. K. Hoffman & R Kunze, Linear Algebra, 2th edn. Pearson Education India, 2003.
4. H. A. Taha, Operation Research: An Introduction, 9th edition, Dorling Kindersley, Pearson.

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Reference Books:

1. Kanti Swarup, P.K. Gupta & Man Mohan., Operational Research, Sultan Chand & Sons New Delhi .
2. Dennis G. Zill and Patrick D. Shanahan, A first course in Complex analysis with applications, 2nd edn., Jones and Bartlett, 2010.
3. Erwin Kreyszig, Advanced Engineering Mathematics, 9th edn., Wiley India, 2009.
4. Levin R. I. & Rubin D. S., Statistics for Management, 7th edition, PHI, New Delhi, 2000.
5. S.M. Ross, Introduction to Probability and statistics for Engineers, 3rd edition, Academic Press, Delhi, 2005.
6. S Ponnusamy, Foundations of Complex Analysis, 3nd edn., Norosa Publishing house New Delhi-2009