I	Course Code	**MA 5005 (Open elective – Ph.D.)**
II	Course Title	**Reliability Engineering**
III	Credit Structure	L T P C 3 1 0 4
IV	Prerequisite (If any)	Probability & Distributions
V	Course Content	Definition of reliability and its measures, mean time to failure, mean time between failure, Maintainability and availability. Concept of failure- Bath tub curve. Life testing & Failure distributions: exponential, Weibull and gamma with their properties and uses. Maximum Likelihood Estimation, Reliability using standard probability models based on complete and censored samples (type I, type II and left right and interval censoring). Non-parametric estimation of reliability: Kaplan-Meier type estimators. Model selection criteria and comparison of nested models (-2logL and AIC). Acceptance sampling based on reliability test, Accelerated life testing. System configurations: series, parallel, bridge and r-out of-n system; their block diagrams, Usefulness of redundancy and improvement factor. Cold and hot redundancy, reliability of stand-by system. Stress-strength reliability model. Competing risks model, Accelerated life testing.
VI	Text/References	- Reliability Engineering, Balagurusamy E., Tata Mc-Graw Hill Publications , New Delhi. - Statistical Analysis of Reliability and Life- Testing Models, Bain, L.J, Dekker, New York, - Statistical Theory of Reliability and Life Testing Probability Models, Barlow R.E. & Proschan, F., Holt, Rinehart and Winston, New York. - Practical Reliability Engineering, Connor, P.D.T.O., John Wiley. - An Introduction to Reliability and Maintainability Engineering, Charles E Ebling,, Tata-McGraw Hill - Life Testing and Reliability Estimation, Sinha, S.K. and Kale, B.K., Wiley Eastern, Delhi. - Mathematical Theory of Reliability, Barlow, R.E. and Proschan, F, John Wiley, New York. - Survival Analysis: Techniques for censored and Truncated Data. Klien, J.P. and Moeschberger, M.L.: 2ed. Springer. Statistical Models and Methods for Lifetime Data, Lawless, J. F., J. Wiley, New York.