I Year M.Tech. Machine Design, I Semester	L	T	P	TO	C
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(ME 517) RELIABILITY ENGINEERING
(ELECTIVE - II)

Objective of the course:
Reliability is one of the biggest concerns with almost all physical Systems used in the industry. This course equips the students with all the concepts and tools that are required to assess & Manage risk and plan for uninterrupted and hassle free operation of industrial systems.

UNIT - I
Reliability Engineering : Reliability function – failure rate – Mean time between failures (MTBF) – Mean time to failure (MTTF) – Probability concept - Additional of probabilities - complimentary events - useful life availability – maintainability – system effectiveness.

UNIT - II
Reliability Data Analysis : Time to failure distributions – Exponential, normal, Gamma, Weibull, ranking of data – probability plotting techniques – Hazard plotting.

UNIT - III
Reliability Prediction Models : Series and parallel Systems – RBD approach – Standby systems – m/n configuration – Application of Baye's theorem – cut and tie set method – Markov analysis – FTA – Limitations.

UNIT - IV
Reliability Management : Reliability Testing – Reliability growth monitoring – Non parametric methods – Reliability and life cycle costs – Reliability allocation – Replacement model.

UNIT - V
Risk Assessment : Definiton and measurement risk – risk analysis techniques – risk reduction resources – industrial safety and risk assessment.

TEXT BOOKS:

1. John Davidson, "The Reliability of Mechanical System", 2nd Edition, Published by the Institution of Mechanical Engineers, London, 1998.
2. E. Balaguru Swamy "Reliability Engineering" 1st Edition, Tata Mc.Graw Hill, New Delhi, 2003.

REFERENCE BOOKS:

1. Modarres, "Reliability and Risk analysis", 1st Edition, CRC Press, 1992.
2. Smith C.O. "Introduction to Reliability in Design", 1st Edition, McGraw Hill, London, 1976.
3. Charles E. Ebeling, "Reliability and Maintainability Engineering", 2nd Edition, Tata Mc Graw Hill, 2009.