Subir Chowdhury School Quality and Reliability
IIT Kharagpur

Training Course for Titan on Reliability Engineering

Module	Topics Covered	No of days (6hrs/day)
1	**Introduction to Course:** Introduction to Reliability Engineering Reliability Mathematics: Discrete Distributions, Continuous Distributions Exercises using Excel/ Minitab	2
2	**Component and System Reliability Modeling:** Reliability Block Diagram, Series, parallel, network, k-out-of-m, stand-by systems models, Markov Models, Exercises/Cases using Excel/ Minitab	2
3	**Root Cause Failure Analysis:** Fault Tree Analysis, Event Tree Analysis Why Why Analysis, Pareto Analysis Failure Mode Effect and Criticality Analysis Cases/Examples	2
4	**Quality Control and Analysis:** Introduction To Quality, Control Charts, Tolerance Analysis, Sampling Plans, Exercises/Cases using Excel/ Minitab	2
5	**Quality Through Design:** Design of Experiments, Taguchi Methods, Robust Design, Exercises Using Excel/ Minitab	2
6	**Design for Reliability:** Reliability Specifications And Allocation, Reliability Prediction, Reliability Design Techniques, Exercises/cases using Excel/ Minitab	2
7	**Reliability Testing:** Types of life tests, Burn-in Tests, Accelerated Life Tests, Highly Accelerated Life Tests, Reliability Growth Tests, Exercises/Cases Using Excel/ Minitab	2
8	**Reliability Estimation:** Introduction To Estimation, Non-Parametric Data Analysis, Parameter Estimation, Exercises/Cases using Excel/ Minitab	2

9	**Field Data and Repairable System Analysis:** Introduction to types of failure data models, Non-Repairable systems and Repairable Systems, Down Time Analysis, Availability, Maintainability Analysis, Statistical Test to dependency, Trend etc. Warranty and field failure Data. Discuss Sample Cases by Titan/ Exercises using Excel/ Minitab	2
10	**Reliability Centered Maintenance (RCM):** RCM Concepts Components and Matrices, Type of Maintenance, Electrical Safety Aspects, RCM Case	2
11	**Software Reliability:** Software Fault Tolerance, Software Reliability Models, Software Reliability Prediction: Artificial Neural Network Approach, Software Reliability Prediction: Fuzzy Logic Approach, Exercises	2
		22

NOTE:

- J1, J2, J3, J4: projects from Jewelry area
- Each module has an assignment.
- No of participants = 30
- Time between modules is 2 weeks
- Total period for completion of course is approximately 5 months
- The course is accompanied by a project (each team consists of 1-2 participants)
- Final Project Evaluation: 3 months from last module