FIRST SEMESTER 2021-2022
COURSE HANDOUT (PART-II)

Date: 08/09/2021

In addition to Part-I (General Handout for all courses appended to the timetable), this portion gives further specific details regarding the course.

Course Code   : *ME F443*
Name of the Course   : **Quality Control Assurance and Reliability**
Instructor-In-Charge   : **PHANEENDRA KIRAN CHAGANTI**

I. Course Description:

Basic concepts of probability and probability distributions, standard probability distribution, sampling and sampling distributions, confidence intervals, testing significance, statistical tolerance, various types of control charts, statistical process control techniques, value analysis, defect diagnosis and prevention, basic concepts of reliability, reliability design evaluation and control, methods of applying total quality management, production process.

II. Scope and Objective of the Course:

The subject aims to introduce students to the ideas of quality management and the use of statistical methods in this field. At the end of this subject, students be able to learn about understand the role of quality control and quality improvement in organizations, apply the ideas of TQM to organizations and identify appropriate strategies for dealing with issues of quality, identify which type of control chart is appropriate for particular data, apply that control chart and draw conclusions, design simple factorial experiments, analyze data from factorial experiments and draw conclusions. Concepts of reliability and methods to improve product and system reliability are dealt with. The course is tailored to enable practicing engineers to become successful managers in a sustained manner to provide business houses the leading edge.

III. Textbook

1. Mitra. A, "Fundamental of Quality Control and Improvement", Prentice Hall of India Ltd., 2nd Edition, 3rd Indian Reprint, 2004.

Reference Books

1. Gryna F.M., Chua, R. C. H. and Defeo, J. A., "Juran's Quality Planning and Analysis for Enterprise Quality", Tata McGraw Hill, 5th Edition 2007.
2. Douglas C. Montgomery, "Introduction to Statistical Quality Control", John Wiley & Sons, 4th Edition, 2003.

IV. Course Contents

No of Lectures	Learning Objectives	Topics to be covered	Chapter in the Text Book

2	To understand the basic quality concepts	Introduction to Total quality control and the total quality system	T1& class notes
2	Understand the quality philosophies	Some philosophies and their impact on quality	T1& class notes
3	To learn the standard quality tools used by industry	Quality management: Practices, tools and standards	T1& class notes
4	Learn the statistics fundamentals used in quality control	Fundamentals statistical concepts and techniques in quality control and improvement	T1& class notes
2	To learn graphical analysis of data, testing of distributional assumptions, analyzing qualitative data, sampling techniques	Data analysis and sampling	T1& class notes
4	To understand necessary background before applying the control charts	Statistical Process Control using control charts	T1& class notes
5	To learn how and when to use control charts for measurable quality characteristics	Control chart or variables	T1& class notes
5	To learn how and when to use control charts for non-quantifiable quality characteristics	Control charts for attributes	T1& class notes
6	Understand how to evaluate whether a product or process meets the specification and to learn tolerances for assemblies	Process capability analysis	T1& class notes
4	Learn Procedures for product acceptance for variables and attributes	Acceptance sampling plans	T1& class notes
3	Learn how to assure quality during manufacturing of product or rendering of service	Reliability	T1& class notes
5	To learn principles of experimental design to select optimal product and process parameters	Experimental Design and the Taguchi method	T1& class notes

V. Evaluation Scheme and Schedule:

EC No.	Component	Duration	Weightage (%)	Date & Time	Nature of Component
1	Midtest	90 min	25	21/10, 11-12:30 PM	OB
2	Class test (surprise)	-	15		CB
3	Assignments/ Course Project	-	20		OB
4	Comprehensive exam	2 hours	40	20/12 FN	CB

Course Project:

1. One course project will be required on one of the following general topic areas: Developing a MATLAB code for one of the topics discussed in the course. For example, Control chart for attribute, Control chart for variables, Hypothesis testing, Design of experiments, Reliability engineering etc. (10%)

2. Two assignments on solving the assigned problems using MINITAB software (5%)

VI. Chamber Consultation Hour: To be announced in the class.

VII. Notices concerning the course: All notices concerning the course will be displayed on the CMS notice board.

VIII. Make-up Policy: Make-up will be permitted only in genuine medical cases with prior permission.

IX. Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

NOTE: The border cases in final grading will be decided based on mainly class room attendance and attentiveness in the classroom.

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Instructor-In-Charge