STATISTICAL QUALITY CONTROL

CourseCode		Year		Semester	
Course Category	HONORS	Branch	ME	Course Type	Theory
Credits	3	L – T – P	3 – 0 – 0	Prerequisites	IEM
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Outcomes: Upon successful completion of the course, the student will be able to

	Statement	Skill	BTL	Units
CO1	Understand basics of Quality Basics and History, Modeling Process Quality, Statistical Quality Control and Control Charts for Attributes, Acceptance Sampling.	Understand	L2	1,2,3,4,5
CO2	Apply Quality Principles, Modelling Process Quality and Acceptance Sampling.	Apply	L3	1,2,5
CO3	Analyze the Concept of variability and Control chart with line trend, Control Charts for Attributes.	Apply	L4	3,4
CO4	Analyze the Quality function and Modelling Process Quality.	Analyze	L4	1,2

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1		1			2		2			3		1	3
CO2	1		1			2		2			3		1	3
CO3	1		1			2		2			3		1	3
CO4	1		1			2		2			3	3	1	3

Syllabus

UNIT	Contents	Mapped COs
I	Quality Basics and History: Meaning of quality, Factors effecting quality, Quality Principles, Quality function, Quality control, Aims and objectives of quality control, Characteristics, Cost of quality, Value of quality, Seven QC tools, Need of management of product quality, Historical perspective of quality control.	CO1 CO2 CO4
II	Modeling Process Quality: Variation: Stem-leaf Plot, Frequency distribution Histogram, Box Plot, Discrete Distributions Hyper geometric Distribution, Binomial distribution, Poison Distribution, Continuous Distributions- Normal, Gamma, Exponential and Weibull's distribution.	CO1 CO2 CO4
III	Statistical Quality Control: Introduction, Concept of variability , Common vs. Special Causes, Types of Control charts, Measurement of control limits, Control charts for variables -large sample data, Warning limits, Revised control limits, Group control chart, Control chart with line trend.	CO1 CO3
IV	Control Charts for Attributes: Control charts for non-confirming Models, control charts for fraction non- conforming. Process and Measurement	CO1 CO3

	System Capability Analysis: Using Probability plot, process capability ratios, specification limits and Tolerances.	
V	Acceptance Sampling: Introduction, Advantages and Disadvantages of Sampling methods, Sampling techniques, Sampling Risks and indices, Operating characteristic curves, Average outgoing quality Limit. Sampling plans Single, Double, Multiple and Sequential Sampling Plans Tightened Inspection, Dodge-Rooming system, Sequential plans.	**CO1 CO2**

Learning Resources
Text books
1.E. L. Grant Richard, R.S. Leavenworth, Design Statistical Quality Control, 7th Edition, McGrawHill Pvt Ltd New Delhi, 2011. 2.D. C. Montgomery, Statistical Quality Control,7th Edition, John Wiley Sons, 2012.
Reference books
1.M. Mahajan, Statistical Quality Control, Revised Edition, Dhanapat Rai & Co, 2007. 2.W.W.Hines, D. C.Montgomery, Probability and Statistics in Engineering and Management Science, John Wiley and Sons, New York, 1990. 3.Kapoor, V.K. and Gupta, S.P. (1978): Fundamentals of applied statistics, Sultan Chand & Sons. Gupta, R.C.(1974): Statistical Quality Control.
E- Resources & other digital material
1.https://nptel.ac.in/courses/116/102/116102019/