ME372: INDUSTRIAL ENGINEERING AND QUALITY CONTROL
CREDITS = 5 (L=3, T=0, P=2)

Course Objective:

To understand aspects like: Plant location and its selection, Optimized Plant layout and apply different concept of production planning and control. Study of productivity and Work-study, apply it in the industry for productivity improvement. To understand different aspects of SQC and their applications.

Teaching and Assessment Scheme:

Teaching Scheme			Credits	Assessment Scheme				
L	T	P	C	Theory		Practical		Total Marks
				ESE	CE	ESE	CE	
3	0	2	5	70	30	30	20	150

Course Contents:

Unit No.	Topics	Teaching Hrs.
1	**Plant Location Selection and Layout:** Nature of location decision, Importance of plant location, Dynamic nature of plant location, Choice of site for selection, Comparison of location Principles factors governing flow pattern, travel chart, analytical tools of plant layout, Quantitative methods of plant layout: CRAFT and CORELAP, Relationship diagrams.	08
2	**Material handling:** Principles of Material handling, Types of Material handling, Selection of Material handling equipment	03
3	**Productivity and Work Study:** Definition of productivity, application and advantages of productivity improvement tools, reasons for increase and decreases in productivity. Areas of application of work study in industry, Reaction of management and labor to work study. *Method Study:* Objectives and procedure for methods analysis, Recording techniques: String Diagram, Operations Process Chart, Flow Process Chart, Flow diagram, Man-Machine, Multiple Activity Chart, Travel Chart, and Two	13

Handed process chart, Therbligs, Micro-motion and macro-motion study: Principles of motion economy, SIMO chart, Normal work areas and work place design.

Work Measurement: Objectives, Work measurement techniques – time study, work sampling, pre-determined motion time standards (PMTS) Determination of time standards

4	**Job Evaluation and Wage Plan:**	05

Objective, Methods of job evaluation, job evaluation procedure, merit rating (Performance appraisal), method of merit rating, wage and wage incentive plans, Non monitory incentives.

5	**Inspection and Statistical Quality Control:**	10

Inspection – functions, types, objectives and benefits, quality control principles, Concepts of quality circles, Total quality management, concept of Zero Defect, Quality assurance, Quality audit, Basic Concept ISO 9000, ISO 14000 and QS 9000, Six sigma: Concept, Principle, Methodology, Scope, Advantage and limitations.

SQC Concept, variable and attributes, normal distribution curves and its property charts for variable and attributes and their applications and interpretation (analysis) process capability. Acceptance sampling, sampling plans, OC curves and AOQ curves.

6	**Industrial safety and Ergonomics:**	05

Introduction to Industrial hazards and safety, Safety analysis: Personal protective equipment, Survey the plant for locations and hazards, Industrial Acts. Scope and objectives of ergonomics, Man-machine interface, anthropometry, Application of human factors in engineering, Work place design.

TOTAL	**44**

Reference Books:

1. Barnes, R.L., *Motion and Time Study, Design & Measurement of Work*, 7th edition, John Wiley & Sons, New York, 1980
2. *Work study*, International Labour Organisation (ILO)
3. Currie R.M, *Work Study*, ELBS & Pitman, London, 1977
4. M. Mahajan, *Industrial Engineering and Production Management*,
5. Srivastava S.K., *Industrial Maintenance Management*, S. Chand & company
6. Martand Telsang, *Industrial Engineering and Production Management*, S Chand & company
7. Banga and Sharma, *Industrial Engineering and Production Management*, Khanna Publishers
8. Eugene L. Grant and Richard S. Leavenworth, *Statistical Quality Control*, McGraw hill.

Course Outcomes (COs):

1. Select appropriate plant location for the given project and to develop optimized plant layout.

2. Recommend different material handling equipment as per the requirement.

3. Apply the concepts of productivity and work-study.

4. Evaluate job and wage plans using different methods.

5. Analyze the concept of inspection and SQC to enhance productivity.

6. Employ the concepts of ergonomics in designing of various products.