

3ME81: INDUSTRIAL ENGINEERING AND QUALITY ASSURANCE
CREDITS - 3 (LTP: 3,0,0)

Course Objective:

1. To select appropriate plant location and layout.
2. To apply the concept of productivity and work-study.
3. To understand different aspects of quality assurance and their applications.

Teaching and Assessment Scheme:

Teaching Scheme (Hours Per Week)			Credits	Assessment Scheme				
L	T	P		C	Theory Marks		Practical Marks	
			ESE		CE	ESE	CE	
3	0	0	3	60	40	00	00	100

Course Content:

Unit No.	Topics	Teaching Hours
1	<p>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, types of plant layout and selection of layout, Quantitative methods of plant layout: CRAFT and CORELAP, Relationship diagrams, Principles factors governing flow pattern, travel chart.</p>	08
2	<p>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. <i>Method Study:</i> 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 Handed process chart, Therbligs, Micro-motion and macro-motion study: Principles of motion economy, SIMO chart, Normal work areas and work place design. <i>Work Measurement:</i> Objectives, Work measurement techniques – time study, work sampling, pre-determined motion time standards (PMTS) Determination of time standards</p>	12
3	<p>Job Evaluation and Wage Plan: Objective, Methods of job evaluation, job evaluation procedure, merit rating (Performance appraisal), method of merit rating, wage and wage incentive plans, Non monetary incentives.</p>	05

Unit No.	Topics	Teaching Hours
4	Inspection and Statistical Quality Control: Inspection – functions, types, objectives and benefits, quality control principles, Concepts of quality circles, Total quality management, PDCA cycle, concept of Zero Defect, 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 Quality assurance, Quality audit.	10
5	Industrial Legislation: Need for Industrial legislation, Factories act 1948, Industrial dispute act 1947, The Indian trade unions act 1926, Industrial employment act 1946, Payment of wage act 1936, Workmen compensation act 1923, Payment of bonus act 1965, Employees provident fund scheme 1952.	03
6	Ergonomics: Scope and objectives of ergonomics, Man-machine interface, anthropometry, Application of human factors in engineering, Work place design.	04
Total		42

List of Reference:

1. Banga and Sharma, “*Industrial Engineering and Production Management*”, Khanna Publishers
2. Barnes, R.L., “*Motion and Time Study, Design & Measurement of Work*”, 7th edition, John Wiley & Sons, New York, 1980
3. Currie R.M, “*Work Study*”, 4th edition, ELBS & Pitman, London, 1977
4. M. Mahajan, “*Industrial Engineering and Production Management*”, 2nd edition, Dhanpat Rai & CO. (P) LTD, 2002.
5. M. Mahajan, “*Statistical Quality Control*”, 3rd edition, Dhanpat Rai & CO. (P) LTD, 2002.
6. Martand Telsang, “*Industrial Engineering and Production Management*”, 2nd edition, S Chand & company, 2002.
7. International Labour Organisation (ILO), “*Introduction to Work study*”, Oxford and IBH Publishing.

Course Outcomes (COs):

At the end of this course students will be able to ...

1. Select an appropriate plant location and develop optimized plant layout.
2. Apply the concepts of productivity and work-study.
3. Evaluate job and wage plans using different methods.
4. Analyze the concept of inspection and quality assurance to enhance productivity.
5. Understand industrial legislation.
6. Explain the concepts of ergonomics in designing of various products