INSTITUTE	**DIPLOMA STUDIES**
PROGRAM	**DIPLOMA ENGINEERING (MECHANICAL ENGINEERING)**
SEMESTER	**5**
COURSE TITLE	**INDUSTRIAL ENGINEERING**
COURSE CODE	**09ME1501**
COURSE CREDITS	**4**

Objective:

1 Main aim of any industries to improve the efficiency, productivity of plant and set the better standard of quality in international market. Technical managers, engineers and plant operators working in industries have to compulsorily meet set standards of production in terms of quality, quantity and productivity so as to compete domestic and international market. Industrial engineering helps to solve the industrial issues. Furthermore, Industrial engineering gives idea about material management, production, planning, cost control and value analysis of product.

Course Outcomes: After completion of this course, student will be able to:

1 Basics of industrial engineering
2 Study and prepare work study and process plan for mechanical component
3 To study about quality assurance of product
4 To study about various tools of SQC
5 Needs of plant layout and material handling equipment in industries.
6 To study about recent developments in industrial management

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**INTRODUCTION TO INDUSTRIAL ENGINEERING** Concept of industrial engineering, Definition and objectives, Scope and importance of industrial engineering, Methodology and approaches, Concept of productivity, Methods of to increase the productivity, Simple numerical, Work study and statistical quality control	4

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Contents : Unit	Topics	Contact Hours
2	**WORK STUDY** Definition, techniques and role to enhance productivity, Effect of human factors in application of work study techniques, Procedure of method study,Standard symbol of method study, Process, Charts and diagram, Concept process planning, Importance of process planning, Prepare process plan for mechanical component , Prepare flow process and flow diagram for mechanical component, Procedure of work measurement, Principle of micro motion study and SIMO chart, Man and machine chart, Equipment used in time study, Allowances & types, Concept of basic time, Standard time and work content, Concept of work sampling activity	14
3	**QUALITY ASSURANCE** Equipment used in time study, Allowances & types, Concept of basic time, Standard time and work content, Concept of work sampling activity, QA tools, Difference between inspection and quality control, Concept of total quality control, Fundamentals of statistics-types of variation, Concept of probability and normal distribution, Introduction to binomial and Poisson distribution	6
4	**STATISTICAL QUALITY CONTROL** Concept of variability, SQC tools and statistical fundamental, Difference between variable and attributes, Various types of control chart, Objectives, Application, X-chart-R chart, Calculation of control limit, Concept of process capability, Acceptance sampling	8
5	**PLANT LAYOUT AND MATERIAL HANDLING EQUIPMENTS** Plant layout: Concept and Definition, Classification of plant layout, Application, Advantage & limitation, Important role of material handling equipment in industries, Classification material handling equipment, Selection criteria	4
6	**RECENT TENDS IN INDUSTRIAL ENGINEERING** International Organization for standardization and its role project, Total Quality Control (TQC) and Total Quality Management (TQM), Concept of six sigma, Application, Kaizen method, Importance of ergonomics in industrial engineering, Normal and maximum working area, Environmental condition for work place	6
Total Hours		**42**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Experiment-1** Prepare process plan for any mechanical component	4
2	**Experiment-2** Prepare flow diagram for any mechanical component	2
3	**Experiment-3** Prepare operation process chart for an mechanical component	2

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Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
4	**Experiment-4** Prepare Man and machine chart at given condition	2
5	**Experiment-5** To study about time study	4
6	**Experiment-6** Prepare X-bar R chart for given component	2
7	**Experiment-7** Determine control limits of given problem.	4
8	**Experiment-8** To study about acceptance sampling tool	6
9	**Experiment-9** Prepare industry visit report	2
Total Hours		**28**

Textbook :

1 Industrial Engineering, R.R.Mahitcha, Atul Prakashan, 2018

References:

1 Industrial Engineering & Management. by O. P. Khanna

2 CPM & PERT principles and Applications. by L.S.Srinath.

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking**
28.00	35.00	37.00			

Instructional Method:

1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.

3 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.

Supplementary Resources:

1 www.youtube.com/watch?v=SF53ZZsP4ik

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Supplementary Resources:

2 www.criticaltools.com/pertchartexpertsoftware.htm
3 www.youtube.com/watch?v=iPZlQ3Zx5zc
4 en.wikipedia.org/wiki/Program_evaluation_and_review_technique
5 www.netmba.com/operations/project/pert

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