SEMESTER S4

INDUSTRIAL ENGINEERING

Course Code	PEMRT 411	CIE Marks	40
Teaching Hours/Week (L: T:P: R)	3:0:0:0	ESE Marks	60
Credits	3	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	None/ (Course code)	Course Type	Theory

Course Objectives:

1. To enable students to understand, design, analyse about processes in various industries
2. To develop decision making, problem solving, project managing skill among students

SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	Introduction to industrial engineering- concepts and functions of industrial engineering- Manufacturing Vs purchase-problems-economic aspects- C-V-P analysis-simple problems Ergonomics man machine system- Anthropometry – value engineering	7
2	Work place design and ergonomics Work study: procedure-concept of work content- techniques to reduce work content Study method: steps-recording techniques-operation process chart- flow process chart- two hand process chart-multiple activity chart Diagrams: flow diagram- string diagram Principle of motion economy- SIMO chart Work measurement: techniques-time study- steps in time study- calculation of standard time (problems)	10
3	Plant: location, layout, material handling concepts Plant layout: types- tools and techniques-travel chart- REL chart- computer algorithms for layout design: CRAFT-ALDEP (methods only) system layout planning-line balancing- RPW (Problems) Principles of material handling: unit load concept- automated material	9

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	handling system-AGVs	
4	Production cost concepts- production planning & control-types of production systems Demand forecasting:forecasting methods- Gantts chart Need for new product-product life cycle Quality control:statistical quality control-causes and variations in quality-control charts for X and R. Reliability: causes of failure- bath tub curve-system reliability Project mamagement:critical path method- PERT-determination of economic life- replacement policy- methods of replacement analysis (Simple problems)	**10**

Course Assessment Method

(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
5	**15**	**10**	**10**	**40**

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End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
• 2 Questions from each module. • Total of 8 Questions, each carrying 3 marks **(8x3 =24marks)**	• Each question carries 9 marks. • Two questions will be given from each module, out of which 1 question should be answered. • Each question can have a maximum of 3 sub divisions. **(4x9 = 36 marks)**	**60**

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	To understand the basic concepts of industrial engineering and various process involved in it	**K2**
CO2	To study about the feasibility of good working environment, designing of work place, working measurements etc	**K2**
CO3	To enable students to get a deep knowledge about manufacturing plants, their designs and various algorithms used for preparing design layouts	**K2**
CO4	To provide knowledge about how production, quality control and project management is done	**K2**
CO5	To understand the basic concepts of industrial engineering and various process involved in it	**K2**

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

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CO-PO Mapping Table (Mapping of Course Outcomes to Program Outcomes)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	-	-	-	2	-	1	-	-	-	2
CO2	3	3	3	2	-	2	1	1	1	-	1	2
CO3	3	3	3	2	2	1	-	-	1	-	2	2
CO4	3	3	2	2	-	3	2	3	2	-	3	3
CO5	3	1	-	-	-	2	-	1	-	-	-	2

Note: *1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation*

Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Industrial Engineering & product management	Martand Telsang	S chand	Third revised edition,2018
2	Industrial Engineering	B Kumar	Khanna publisher	10th Edition, 2015
3	Industrial engineering & production management	M Mahajan	Dhanpat Rai	2015
4	Manufacturing planning & control for supply chain management	Thomas E Vollmann, William L Berry, D Clay Whybark, F Robert Jacobs	McGraw Hill Education	5th Edition, 2017

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Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Industrial Engineering and management	O P Khanna	Dhanpat Rai	2015
2	Statistical Quality control	Grant and Ieven worth	McGraw Hill	2000
3	Modern production management	E S Buffa	John Wiley	1983
4	Facility layout and location: An Analytical approach	Richard L Francis, F McGinnis Jr, John A White		2nd Edition , 1991

Video Links (NPTEL, SWAYAM…)	
Module No.	**Link ID**
1	https://youtu.be/yhywrCChJBQ?si=ZQVmu80Tv2002lGn
2	https://youtu.be/yhywrCChJBQ?si=ZQVmu80Tv2002lGn, https://youtu.be/zWQovrjB7Uc?si=dqf7k4WOyUvCJpEQ
3	https://youtu.be/yhywrCChJBQ?si=ZQVmu80Tv2002lGn, https://youtu.be/jdFrBtHeJbs?si=xYkca1jh6Ur6syr7
4	https://youtu.be/yhywrCChJBQ?si=ZQVmu80Tv2002lGn, https://youtu.be/jdFrBtHeJbs?si=xYkca1jh6Ur6syr7

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