

GUJARAT TECHNOLOGICAL UNIVERSITY

MECHANICAL (INDUSTRIAL ENGINEERING) (46)

PRODUCTION MANAGEMENT SYSTEMS

SUBJECT CODE: 2724610

SEMESTER: II

Type of course: Open Elective

Prerequisite: NA

Rationale: The aim of this course is to make students understand and appreciate the importance of production management in the industrial and business systems. Students can develop understanding of topics such as, production planning and control, Just in time methodology, Value Engineering, Work study.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks	
L	T	P		Theory Marks		Practical Marks			
			ESE (E)	PA (M)	ESE (V)		PA (I)		
					ESE	OEP	PA	RP	
3	2#	2	5	70	30	20	10	10	10

Contents:

Sr. No.	Topic	Hours	% Weightage
1	Introduction: Manufacturing systems - Job shop production, Batch production, Mass production – Characteristics	04	12
2	Production Planning and Control: Functions and objectives of PPC, phases of PPC, Aggregate Planning and Master Production Scheduling	03	08
3	Introduction to MRP and MRP II: MRP Concept, Product Structure and Bill of Material, Lot sizing in MRP systems – Minimum cost per period method, Period order quantity method, Least unit cost method, Part period balancing method, Evolution from MRP to MRP II – Closed loop concept.	10	20
4	Just In Time (JIT): Introduction to JIT Manufacturing, Working of Kanban System, Push and Pull Manufacturing Comparison	03	05
5	Introduction to Work Study: Concept and scope of Method and Time Study, Operation Process Chart, Flow Process Chart, Flow Diagram, Man and machine chart, Two handed process chart, Principles of Motion Economy, Different tools and techniques of work measurement.	10	20
6	Production Scheduling: Single machine scheduling [Conditions/Assumptions of single machine scheduling, Definitions of Processing time, Ready Time, Due date, Completion time, Flow time, Lateness, Tardiness, Mean flow time, Mean tardiness, Shortest Processing Time (SPT) Rule to minimize mean flow rate, Weighted Mean flow rate, Earliest Due Date (EDD) Rule to minimize maximum lateness], Flow Shop	10	20

	Scheduling [Conditions/Assumptions of flow-shop scheduling, Johnson's Algorithm for 2 machines n jobs problems], Job Shop Scheduling [Introduction, Graphical solution of 2 jobs and M machines],		
7	Introduction to Value Engineering: Concept and Objectives of Value Engineering, Understanding the terms Value, Cost, Worth, Function, Types of Value, Cost-Function Relationship, Introduction of Value Analysis Techniques, Difference Between Value Engg. and Value Analysis, Advantages and Applications.	05	15
		45	100

Text Books:

- 1 Production and Operations Management by R. Panneerselvam, Prentice –Hall of India Private Limited, New Delhi.
- 2 Introduction to Work Study, I.L.O., 3rd Revised Edn.
- 3 Production and Operations Management by K C Arora, Laxmi Publications (P) Ltd., New Delhi.
- 4 Industrial Engineering and Management by M Mahajan, Dhanpat Rai Publications, New Delhi.
- 5 PPC and Industrial Management by K C Jain & L N Agrawal.
- 6 Modern Production Management by Buffa.
- 7 Production System, Planning, Analysis and Control by J L Riggs.
- 8 Industrial Engineering and Operations Management by S K Sharma, Savita Sharma and Tushar Sharma, S K Kataria & Sons, New Delhi.

Course Outcome:

After learning the course the students should be able to...

- 1) To understand the concept of production systems.
- 2) To know the concept of production planning and control.
- 3) To understand the concept of MRP and MRPII
- 4) To understand Value Engineering concepts.
- 5) To understand JIT methodology.
- 6) To understand basics of workstudy.

List of Experiments:

- 1) Exercise on production planning and control.
- 2) Exercise on Just in time methodology.
- 3) Exercise on MRP.
- 4) Exercise on production scheduling.
- 5) Exercise on workstudy
- 6) Exercise on values engineering.

Open Ended Problems:

- 1) Students can refer and analyze successful implantation cases of JIT in the industries from research papers, other secondary database such as, company website, magazines etc.

- 2) Students can refer and analyze successful implantation cases of Value engineering in the industries from research papers, other secondary database such as, company website, magazines etc.

Major Equipment's: NA

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.