GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3161508
Semester –VI
Industrial Engineering
Subject Name: Production Planning and Control

Type of course:

Prerequisite: Nil

Rationale:
The operations function consists of the core wealth creation processes of a business and helps an organization to efficiently achieve its mission while constantly increasing productivity and quality. This course focuses on the role of production planning & control (PPC) as a strategic element of the total organization. This will cover classic and up to date tools and concepts used to support operational managerial decisions. PPC is intended to provide a basic background in problems and opportunities encountered by managers in contemporary production and operations management.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1	**Production planning:** Benefits and basic functions for production planning, project planning various production planning, types of production and their basic characteristics, identification of different production activities, capacity level of each activity, determination of standard hours available, Master Production schedule: Concept, Strategies, Chase sales, Lot-for-lot.	07
2	**Forecasting, Aggregate planning, Capacity planning** Forecasting: Need for forecasting, role of forecasting in PPC, forecasting methods of qualitative type like judgment techniques. Forecasting methods of quantitative types like time series analysis, least square method, moving average method, exponential smoothing method. Forecasting Errors and Forecasting Bias. Monitoring forecast, need for planning and market research Aggregate planning: Concept of aggregate planning, decision rules, strategies and methods. Capacity Planning: Measurement of capacity, Measures of capacity, Factors influencing effective capacity, short range, medium range and long range capacity planning, Rough cut capacity planning.	08
3	**Process Planning and Line Balancing** Process planning: Prerequisite information requirement, steps in process planning, process planning in different situations, documents in process planning, machine / process	08

	selection. , break even analysis, analysis of new designs, product mix machine or process selection and make & buy decisions, study of route sheet, Economics order quantity of manufacture. Line Balancing: objectives, constraints, terminology in assembly line, heuristic methods like Kilbridge-Wester, Largest Candidate rule, Rank positional weight.	
4	**MRP-I, MRP -II, ERP** Material Requirement planning (MRP-I) and Manufacturing Resource Planning (MRP-II) – general concepts, types of demands, Inputs to MRP, MRP objectives, outputs of MRP, Estimation of planned order releases. Benefits and Limitations of MRP II Enterprise Resource Planning (ERP): Evolution, features, purpose of modeling an enterprise, information mapping, generic model of ERP, Modules in ERP, Methodology of implementation, critical success factors of ERP, Case studies of success and failure of ERP implementations, Introduction ERP packages.	08
5	**Production Scheduling, Sequencing and Line of Balance.** Scheduling: Inputs for scheduling, loading and scheduling devices, factors influencing scheduling, scheduling techniques, use of Gantt Charts and basic scheduling problems. Sequencing: Product sequencing, dispatching, progress report & expediting and control. Johnsons Rule for optimal sequence of N jobs on 2 machine. Process n Jobs on 3 Machines (n/3 problem) and Jackson Algorithm. Processing of 2 Jobs on m Machine (2/m) problem. Machine loading and Line of Balance.	08
6	**Production control:** Functions of production control, effects of production control, dispatching and follow up in job, lot and mass production, evaluating a production control system, designing the production control organization.	06
	Total Hours	**45**

Suggested Specification table with Marks (Theory): (For BE only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	10	25	25	15	15

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. Operations planning and control, Martin K. Starr, Cengage publication
2. Principles & design of production planning & control by sheele, westermann & wimmest
3. Elements of P.P.C. by Eilon (macmillan)
4. Industrial organization & management by Bethel, atwater, smith and stackman
5. Operation Management by Barry shore (Tata-Mcgraw hill)

6. Modern production management by Buffa (John willey)
7. Production management by H.N. Broom (D.B.Taraporevala& sons)
8. Production and inventory control, By Narsimhan, Billington

Course Outcomes: Students will be able to:

Sr. No.	CO statement	Marks % weightage
CO-1	Illustrate production planning functions and interpret manufacturing functions in a better way.	25
CO-2	Develop competency in forecasting, aggregate planning and capacity planning.	25
CO-3	Illustrate process planning, line balancing, MRP, MRP-II and ERP	25
CO-4	Determine logical approach production scheduling, sequencing and line of balance.	10
CO-5	Utilize the concepts of Production control in industry.	15

Term Work:
The term work shall be based on the topics mentioned above.

List of Experiments:

1. Exercise on Production planning.
2. Exercise on Forecasting,
3. Exercise on Aggregate planning.
4. Exercise on Capacity planning
5. Problems on Process planning
6. Exercise on line balancing
7. Case study and demonstration on MRP, MRP II, ERP
8. Exercise on Production Scheduling, Sequencing and Line of Balance
9. Exercise on production Control

Major Equipment:

Nil

List of Open Source Software/learning website: