GUJARAT TECHNOLOGICAL UNIVERSITY

BRANCH NAME: INDUSTRIAL ENGINEERING (15)
SUBJECT NAME: OPERATIONS PLANNING & CONTROL
SUBJECT CODE: 2171501
B.E. 7th SEMESTER

Type of course: Core

Prerequisite: No specific pre-requisite. Students should have primary understanding of production management concepts and necessary quantitative background.

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 operations planning & control (OPC) 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. OPC 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
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		ESE (V)		PA (I)	
					PA	ALA	ESE	OEP		
4	0	2	6	70	20	10	20	10	20	150

Content:

Sr. No.	Content	Total Hrs	% Weight age
1	Production forecasting: Use of forecast, types of forecasts, statistical forecasting, time series analysis models, effects of trend, seasonal and irregular movements in the model, uncertainty of forecast, monitoring forecast, need for planning and market research.	8	12
2	Process planning: Prerequisites of process planning, steps in process planning, break even analysis- analysis- new designs, product mix machine or process selection and make & buy decisions, study of route sheet preparation, economics order quantity of manufacture.	10	16
3	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 schedule,	10	16

4	Aggregate planning: Pure and mixed strategies, Choice of APP, Examples	8	12
5	Master Production Schedule: Concept, Strategies, Chase sales, Lot-for-lot	4	6
6	Materials Requirement Planning: Inputs to MRP, Structure of MRP, Examples of MRP	8	12
7	routing and scheduling in job, lot and mass production, jobs sequencing and machine loading line of balance technique.	6	10
8	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.	6	10
9	Line balancing: Operation sequencing and assembly line balancing, minimum number of theoretical workstations, efficiency of assembly line using heuristic approach.	4	6

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
30	35	15	10	5	5

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 Outcome:

After learning the course the students should be able to understand / apply :

- The role of operations management in the overall business strategy of the firm.
- The interdependence of the operating system with other key functional areas of the firm.
- The role of OPC in various production processes in manufacturing organizations.
- Various forecasting techniques and selection of forecasting models.

- Procedure for process design and process planning.
- Various shop floor planning, scheduling and production control techniques.
- Students will become familiar with Aggregate planning, MPS & MRP techniques.

List of Experiments:

1. To study CIM (computer Integrated Manufacturing)
2. To study GANTT CHART.
3. To Study Index method of scheduling
4. To Study Johnson;s method of scheduling : (a) n jobs & 2 m/c's, (b)-n jobs & 3 m/c"s
5. Study of Assembly line balancing.
6. Study of Sales forecasting techniques.
7. Study of EOQ and EMQ.
8. Study of Beak Even Analysis Technique.
9. Study of Process Planning and Route sheet Preparation
10. Study of Capacity Planning & Control.

Design based Problems (DP)/Open Ended Problem: None

Major Equipment: None

List of Open Source Software/learning website: www. nptel.ac.in

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.