

GUJARAT TECHNOLOGICAL UNIVERSITY

PRODUCTION ENGINEERING Production and Operation Management SUBJECT CODE: 2182501 B.E. 8th SEMESTER

Type of course: Under Graduate

Prerequisite: Nil

Rationale: The course aims to impart basic skills of Production Management & its various functions.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks			Practical Marks			
				ESE (E)	PA (M)		ESE (V)		PA (I)	
				PA	ALA	ESE	OEP			
3	2	0	5	70	20	10	30	0	20	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Process Planning and Process Engineering Process Planning: Introduction, Function, Pre-requisites and steps in process planning, Factors affecting process planning, Make or buy decision, plant capacity and machine capacity. Process Engineering: Preliminary Part Print Analysis: Introduction, Establishing the General Characteristics of work piece, determining the principal Process, Functional surfaces of the work piece, Nature of the work to be Performed, Finishing and identifying operations. Dimensional Analysis: Introduction, types of dimensions, measuring the Geometry of form, Baselines, Direction of specific dimensions. Tolerance Analysis: Causes of work piece variation, Terms used in work piece dimensions, Tolerance stacks. Work piece Control: Introduction, Equilibrium Theories, Concept of location, Geometric Control, Dimensional control, Mechanical control.	10	20
2	Production Forecasting: Introduction of production forecasting, The strategic role of forecasting in supply chain, Time frame, Demand behavior, Forecasting methods- Qualitative and Quantitative, Forecast accuracy.	08	15
3	Scheduling: Introduction, Objectives in scheduling, Loading, Sequencing, Monitoring, Advanced Planning and Scheduling Systems, Theory of Constraints, Employee scheduling	07	14
4	Break-Even Analysis: Introduction, Break-even analysis charts, Break-even analysis for process, plant and equipment selection	06	12
5	Aggregate Operations Planning: Aggregate production planning, Adjusting capacity to meet the demand, Demand management, Hierarchical and collaborative planning, Aggregate planning for services	08	15

6	Assembly Line Balancing: Assembly lines, Assembly line balancing, Splitting tasks, Flexible and U-shaped line layouts, Mixed model line balancing, Current thoughts on assembly lines, Computerized assembly line balancing	06	12
7	Material Management: Introduction, Importance and objectives, Purchasing and Stores: policies and procedures, Vendor development, selection, analysis and rating.	06	12

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
7	14	14	14	21	0

Legends: R : Remembrance ; U = Understanding; A = Application 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 Management by Roberta S. Russell, Bernard W. Taylor III (4th ed.) Pearson PH
2. Operations Management for Competitive Advantage by Chase-Jacobs-Aquilano (10th edition)
Tata Macgraw Hill
3. Process Engineering for Manufacturing By Eary and Johson
4. Industrial Engineering and Production Management By M. S. Mahajan
5. Quantitative Techniques by L. C. Jhamb Vol-I, II

Course Outcome:

After learning the course the students should be able to:

1. Understand Process Planning & Process Engineering
2. Differentiate various methods of Forecasting
3. Implement Scheduling, Aggregate planning & Assembly Line balancing
4. Understand Material Management

List of Experiments:

Tutorials based on above syllabus.

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 be submitted to GTU.