

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme		Bachelor of Technology				Branch/Spec.		Mechanical Engineering	
Semester		VIII				Version		2.0.0.0	
Effective from Academic Year			2021-22			Effective from the batch Admitted in			July 2018
Subject code		2ME8102		Subject Name		Production & Operations Management			
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	0	0	3	Theory	40	60	100
Hours	3	0	0	0	3	Practical	30	20	50
Pre-requisites:									
<ul style="list-style-type: none"> • Basic Mathematics • Production Systems 									
Course Objective:									
<ul style="list-style-type: none"> • Identify and develop operational research models from the verbal description of the real system. • To understanding about the various techniques of demand forecasting and their application in management and managerial decision making. • Understand the various broad functions under production and operations management. • Develop knowledge regarding use of various production planning tools like master production scheduling and materials requirements planning. • Gain insight into the various inventory management and control tools. 									
Theory syllabus									
Unit	Content								Hrs
1	INTRODUCTION TO OPERATION RESEARCH: History of OR, Approach, Techniques & tools, Typical application of OR, Scope of OR, Limitations of OR.								2
2	LINEAR PROGRAMMING: General L.P. Format, Formulation of production problems, Method of solution: Graphical, Simplex, modified simplex, Big M and 2 phase methods, Application of L.P. to solve problems of production systems.								7
3	TRANSPORTATION MODEL: Formulation, methods of solution: North West Corner, Least cost and Vogel's approximation methods; Optimality tests: Stepping stone and MODI methods; Degenerate and unbalanced transportation problems, Application to production systems.								4
4	ASSIGNMENT MODEL: Formulation; Methods of solution: Enumeration, transportation, Hungarian methods; Areas of application in the solution of production problems.								4
5	PROJECT MANAGEMENT: CPM and PERT in project management, Concept of slack/float and its significance; Project cost analysis, Crashing, Resource smoothing and leveling, Applications in production systems.								7
6	INVENTORY MANAGEMENT AND CONTROL: Inventory: need and types, deterministic and stochastic models for inventory management.								5
7	FORECASTING ANALYSIS: Need and benefits; Internal and external factors affecting demand; Types of forecasting models based on time horizon; Types of forecasting based on techniques (causal, time series and judgemental methods); Error analysis.								4
8	PRODUCTION PLANNING: Aggregate production planning; Function and scope; Pure and mixed aggregate planning strategies; Aggressive and reactive strategies. Master production scheduling; Function and scope; Inputs for master production								6

	scheduling; Types of master production schedules. Material requirements planning; Function and scope; Inputs for Materials requirement planning; MRP explosions; Manufacturing resource planning.	
9	INSPECTION AND QUALITY CONTROL: Inspection:- function, types, objectives and benefits. Quality control:- principles, introduction to concepts of quality circles, total quality management and quality assurance. Statistical quality control:- concept, variable and attributes, normal distribution curves, its property charts for variable and attributes and their application, interpretation (analysis) process capability, sampling plans, acceptance sampling, OC curves and AOQ curves. Just in time, Six sigma.	6
Practical content		
The term work shall be based on experimental and analytical work on topics mentioned above		
Text Books		
1	J. K. Sharma, . “Operation Research “ , Macmillan, New Delhi. 4 th Edition	
2	O.P. Khanna., “Industrial Engineering and Management” Dhanpat rai Publications Ltd. Delhi. 2013	
Reference Books		
1	Wilkes Michael, “Operational Research, Analysis and Applications”, Tata McGraw Hill, New Delhi. 2012	
2	Richard Levin et.al. “Quantitative approaches to Management” Tata McGraw Hill, New Delhi.2014	
3	Vohra D.N. “Quantitative Techniques in Management”, Tata McGraw Hill, New Delhi. 4 th Edition	
4	V. K. Kapur, . “Operation Research “ , S Chand & Sons, Delhi, 2012	
5	Elwood S. Buffa & Rakesh K. Sarin, “Modern Production / Operations Management”, Wiley India Pvt. Limited, New Delhi. 8 th Edition	
6	K. K. Ahuja, “Industrial Management”, Khanna Publishers, Delhi. 2012	
7	S.S. Rao, “Engineering Optimization”, New age international Ltd, New Delhi. 2009	
MOOCs Link:		
https://nptel.ac.in/courses/110/107/110107141/ - Production operation Management		
https://nptel.ac.in/courses/112/106/112106134/ - Operation Research		
Course Outcomes:		
After learning this course, student should be able to		
<ol style="list-style-type: none"> 1. Understand the mathematical tools that are needed to solve optimisation problems. 2. Understand the various broad functions under production and operations management. 3. Develop an understanding about the various techniques of demand forecasting and their application in management and managerial decision making. 4. Use of various production planning tools like master production scheduling and materials requirements are planning for increasing effectiveness of shop floor functions. 5. Understand the reasons for keeping inventory and will gain insight into various inventory management and control tools. 		