IE 322 Industrial Operations Analysis -2- 3(3, 1, 0))

Catalog Data

Integer programming, Branch and Bound method, Dynamic programming, Nonlinear

Prerequisite IE 222 MATH 244 Co-requisites None Level 7 Textbook Operations Research, 9th Ed., H. A. Taha, Prentice Hall, 2011 Introduction to operations research, Frederick S. Hillier and Gerald J. Lieberma HILL International Editions, 1990 Learning Objectives To provide the students the knowledge for phases of product design and carry out independent and creative product design and development propic and carry out independent and creative product design and development propic in the programming: Integer programming: Formulations and industrial applications 1. Solution methodologies: Dakin's Branch and Bound method Dynamic programming: Characteristics of dynamic programs Formulation and applications Population and applications Nonlinear programming: Sample applications and graphical illustrations One variable unconstrained optimization Multivariable unconstrained optimization Multivariable unconstrained optimization Multivariable unconstrained optimization One variable unconstrained optimization Multivariable unconstrained optimization Multivariable unconstrained optimization Multivariable unconstrained optimization Multivariable unconstrained optimization Multivariable unconstrained optimization Multivariable unconstrained optimization Multivariable unconstrained optimization Multivariable unconstrained optimization Multivariable unconstrained optimization Absorption programming: Discrete time Markov chains: Markov chains-Basic concepts Steady state distribution in Markov chains & applications 4. Absorption probability distribution & applications Queueing Models: Markovian Models with multiple servers Models with limited capacities 5. Markovian models with multiple servers Models with limited capacities			
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 Markovian Models with single servers Markovian models with multiple servers 	[10]		
Queuing decision models	[14]		
Laboratory Topics None Project work Selecting a real life problem and solving it by using computer			
Computer Usage Solve problems by using Cplex software.			

Learning	1) To introduce the students to more deterministic models in operations research in addition to	
outcomes	providing tools in stochastic environments and to their solution methods. [a,e,h,k]	
	2) To emphasize the formulations of the industrial and engineering problems as integer,	
	dynamic and nonlinear programs, and to learn the techniques to solve them. [a,e,h,k]	
	3) To expose the students to the engineering applications of stochastic models, particularly of	
	Markov chains, and queueing problems and their solutions methods. [a,e,h,k]	
Estimated	Engineering Design: 3 credit hour or 100%.	
Category Content	Engineering Design. 3 credit nour of 100%.	
Prepared by	Dr. Mehdi Mrad	
Preparation Date	23 May 2012	