

IE 469 Manufacturing Systems 3(3,1,1)

Catalog Data	Definition and classification of manufacturing systems; Manufacturing automation fundamentals; Manufacturing strategies (lean manufacturing, agile manufacturing and Application of KBS in manufacturing); performance of manufacturing system; Modeling of manufacturing systems; High volume manufacturing systems design and analysis; Flexible manufacturing performance analysis; automated inspection analyses.			
Prerequisite	IE 361			
Co-requisites	IE 438			
Level	10			
Textbook	1. Groover, M.P.; Automation, Production System, and Computer Integrated Manufacturing, Prentice Hall 2. Askin, R.G. & Standridge, C.R.; Modeling and Analysis of Manufacturing Systems, John Wiley & Sons			
Reference	1. Manufacturing Systems Engineering, Gershwin, S. B.			
Learning Objectives	To provide understanding and awareness about manufacturing systems modeling. Also, to give the knowledge for the design of various manufacturing systems and analyzing their performance.			
Topics (classes)		Topic	Week	Contact, hr
	1.	Introduction to manufacturing systems	(1)	[5]
	2.	Automation Fundamental: Manufacturing functions for automation, automation strategies	(2)	[10]
	3.	Analysis of manufacturing systems performance measures	(2)	[10]
	4.	Modelling in manufacturing systems: function modeling using IDFX0 and IDFX1, Analytical models, simulation models, and Petri net models	(4)	[20]
	5.	1010High volume manufacturing systems: Automated flow line, Automated assembly line design and analysis	(2)	[10]
	6.	Flexible manufacturing systems (FMS): planning, design & performance analysis	(2)	[10]
	7.	Manufacturing strategies	(1)	[5]
Laboratory Topics		Modelling in manufacturing systems: function modeling using IDFX0 and IDFX1, Analytical models, simulation models, and Petri net models		
Project work	Independent group projects for manufacturing design systems following the principle of concepts covered in the course topic			
Computer Usage	Computer use covers course topics			
Learning outcomes	1. Ability to recognize the manufacturing system automation and technologies, [c, e] 2. Ability to Model manufacturing system and analyse its performance, [a, c, k] 3. Capability to plan, design and operate manufacturing systems, [c, k] 4. Capability to work within team during case studies, [c, e, k]			
Estimated Category Content	Engineering Design: 3 credit hour or 100%.			
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Preparation Date	May 2012			