

## **ISYS 4020 - Analysis of Production Systems and Facility Design**

### Catalog Description

ISYS 4020. Analysis of Production Systems and Facility Design. (3) (F) 3 lecture hours per week. P: MATH 3307. Tools and approaches for design and analysis of production systems including strategy, aggregate planning, inventory, location, layout, scheduling, forecasting, and production control systems.

### Required Materials:

1. Nahmias, S. *Production & Operations Analysis (6<sup>th</sup> Edition)*, McGraw-Hill Irwin, 2008 (ISBN 0-07-337785-8)
2. National Council of Examiners for Engineering and Surveying, *Fundamentals of Engineering Supplied-Reference Handbook (8th Edition)*, 2008, ISBN 978-1-932613-30-8. .

### Course Objectives:

Upon completion of this course, students will be able to:

- Define strategic impact of production planning
- Define, analyze, and assess implications of manufacturing system choices
- Analyze and design layouts to meet production needs
- Solve probabilistic inventory and production planning problems
- Relate product needs to various plant and process layout options
- Apply optimization tools to production system analysis
- Apply reliability statistics to production system performance

### Lecture Topics (lecture hours)

- Introduction to Production Systems, strategy and competition (2 hours)
- Forecasting (4 hours)
- Aggregate Planning and strategies (3 hours)
- Capacity analysis: people and machines (2 hours)
- LP application to aggregate planning (2 hours)
- Inventory Control with Known Demand (3 hours)
- Inventory Control with Uncertain Demand (6 hours)
- Supply Chain Management concepts (3 hours)
- Push & Pull Production Control Systems, MRP, & JIT (4 hours)
- Operations Scheduling (3 hours)
- Facilities layout and location (4 hours)
- Material handling and cell design (3 hours)
- Tests (3 hours)

### **Grading:**

<b>Grading</b>		<b>Assessment</b>	
A	90% or better	Homework/Assignments	15%
B	80% or better	Project / paper	15%
C	70% or better	Tests (2) @20% each	40%
D	60% or better	Final Exam	30%
F	Less than 60%	Total	100%