

ME 483 COURSE PROFILE**DEGREE PROGRAM:** Mechanical Engineering

COURSE NUMBER: ME 483	COURSE TITLE: Manufacturing System Design
REQUIRED COURSE OR ELECTIVE COURSE: Elective	TERMS OFFERED: Winter
TEXTBOOK / REQUIRED MATERIAL: No Standard Text. Select Journal publications	PRE / CO-REQUISITES: MECHENG 250 (3 credits)
COGNIZANT FACULTY: Jack Hu	COURSE TOPICS: <ol style="list-style-type: none"> 1. Manufacturing System performance 2. Paradigms of manufacturing 3. Building Blocks of Manufacturing Systems 4. Computer Numerical Control 5. Procedure in manufacturing system design 6. System Productivity 7. Quality of manufacturing systems 8. Responsiveness 9. Cost of manufacturing system 10. Manufacturing System Launch 11. Reconfiguration of Manufacturing System 12. Lean Manufacturing 13. Supply Chain Management
BULLETIN DESCRIPTION: An introduction to the procedures and methodologies for designing manufacturing systems. Topics covered include: paradigms of manufacturing; building blocks of manufacturing systems; numerical control and robotics; task allocation and line balancing; system configurations; performance of manufacturing systems including quality, productivity and responsiveness; economic models and optimization of manufacturing systems; launch and reconfiguration of manufacturing systems; Lean manufacturing.	
COURSE STRUCTURE/SCHEDULE: Lecture; 2 per week @ 3.0 hours	

<p>COURSE OBJECTIVES: for each course objective, links to the Program Outcomes are identified in brackets.</p>	<ol style="list-style-type: none"> 1. To teach the process-level dependence of manufacturing systems. [1, 2, 6] 2. To expose the students to the evolution of manufacturing paradigms. [2, 4] 3. To teach the impact of system configuration on product quality. [1, 2] 4. To teach the analysis and impact of system configuration on productivity. [1, 2] 5. To teach the concepts of cycle time, takt time and line balancing techniques. [1, 2, 6] 6. To provide a technical understanding of the impact of machine reliability, maintainability, and buffers on system throughput. [1, 2, 6] 7. To teach the basic concepts of lean manufacturing, supply chain management, and value stream mapping. [1, 2, 6]
<p>COURSE OUTCOMES: for each course outcome, links to the Course Objectives are identified in brackets.</p>	<ol style="list-style-type: none"> 1. Given a part to be produced, identify candidate manufacturing systems that are capable of creating the part to specification. [1, 2, 3] 2. Weigh tradeoffs between similar manufacturing systems based on general pros and cons in terms of heuristic guidelines. [1, 3, 4] 3. Compute quality characteristics that are associated with different manufacturing systems. [1, 3] 4. Determine throughput of different manufacturing systems capable of producing a given part. [5, 6, 7]
<p>ASSESSMENT TOOLS: for each assessment tool, links to the course outcomes are identified</p>	<ol style="list-style-type: none"> 1. Weekly problem sets 2. One in-class midterm exam 3. One two-hour in-class final exam 4. Term project

PREPARED BY: E. Kannatey-Asibu, Jr.

LAST UPDATED: 06/19/2017