

FALL 2014

MEEJ GPI '587/MFG'587: GLOBAL MANUFACTURING

Class Meets: Monday, Wednesday 3:30 – 5:00pm, Room 2150 Dow

Instructor: Prof. Kira Barton <bartonkl@umich.edu>

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Course Introduction:

This course looks at the many facets related to global manufacturing: 1) through a variety of media, and 2) from high-level broad topics to detailed information specific to certain subjects. In particular, the course will focus on the three main components of a manufacturing enterprise: product design, manufacturing, and the development of a sound business model, to meet the demands of a rapidly evolving manufacturing industry. To address these topics, the course will incorporate a semester-long project that will bridge the material presented in class with a practical, yet innovative and creative project. In addition to the textbook and supplemental readings assigned in class, expert guest lecturers will provide unique insight on the relevant topics covered in the course.

Textbook:

The Global Manufacturing Revolution: Product-Process-Business Integration and Reconfigurable Systems, 1st Edition, by Yoram Koren. Available online from the Mirlyn catalog:

<http://mirlyn.lib.umich.edu/Record/008936542>

Supplemental Readings:

Additional readings will be posted on the course webpage.

Course Webpage:

Accessible through ctools. All class assignments will be posted on course webpage.

Honor Code Policy:

The Engineering Honor Code established by the College of Engineering will be enforced.

ME-587, MFG-587 Global Manufacturing Class Schedule

Class #	Class Description	Due Date (HW, Reports)
Sep. 5	Course Overview, Requirements & Project Description, Importance of Manufacturing	
Section 1: Product Design – (chpts. 1-2)		
Sep. 10	Product Design – intellectual property, patents, component classification	Team Formation
Sep. 12	Product Invention Strategies Manufacturing paradigms and systems overview	HW #1 (overview)
Section 2: Manufacturing Paradigms – (chpts. 3-6, 8-9)		
Sep. 17	Guest Lecturer: Nadine Wong, Patent Office at U-M Customized and personalized products (ch. 3)	
Sep. 19	Mass Production & Lean Production (ch. 4)	HW #2 (Chaps. 1, 2)
Sep. 24	Analysis of Mass Customization (ch. 5)	
Sep. 26	Reconfigurable Machines and Systems (chs. 8-9) Advanced Manufacturing (supplemental readings)	HW #3 (Chap. 3-5)
Oct. 1	Case Study 1: Advanced Mfging Technique Case Study 2: Reconfigurable Manufacturing Paradigm	
Section 3: Manufacturing Economics – (chpts. 7, 10)		
Oct. 3	Guest Lecturer: Start-ups – Ken Ludwig	HW #4 (Chap. 8, 9)
Oct. 8	Manufacturing Economics (ch. 7) System Configuration Strategies (supplemental readings)	
Oct. 10	System Configuration Analysis (ch. 10)	<i>Product Design Report</i>
Oct. 15	<i>Fall Break – no class</i>	
Oct. 17	Case Study 3: Manufacturing Economics (GM) Case Study 4: Configuration Strategies (paper analysis)	
Section 4: IT and Control – (chpt. 12)		
Oct. 22	IT-Based Organization; Maintenance (ch. 12)	
Oct. 24	Sensing and Controls Strategies	HW #5 (Chap. 7, 10)
Oct. 29	Guest Lecturer: Gary Cowger (GM) – Overview of Global Manufacturing	
Oct. 31	Case Study 5: Control Strategies for Mfging (papers) Case Study 6: IT practices – current & future approaches to security, communication, information transfer	HW #6 (Chap. 12)
Section 5: Business Models – (chpt. 11)		
Nov. 5	Responsive Business Models (ch. 11) Supply Chains, EOQ, Delayed Differentiation (ch. 11)	
Nov. 7	Guest Lecturer: Prof. Siqian Shen - Optimization	HW #7 (Control Strategies)
Nov. 12	Bullwhip Effect, Outsourcing (ch. 11) Stochastic Inventory Model, Pricing (ch. 11)	

Nov. 14	Case Study 7: Linear programming strategies for supply chain management Case Study 8: Linear programming strategies for location optimization	<i>Manufacturing Report</i>
Section 6: Globalization / Marketing – (chpts. 13-14)		
Nov. 19	Guest Lecturer: Gary Cowger – Global Business and Marketing Strategies	
Nov. 21	Globalization Strategies (ch. 13) Marketing Strategies (ch. 13)	HW #8 (Chaps. 11)
Nov. 26	Business Plan (ch. 14) Other sources of funding – SBIR, STTR, Investors	
Nov. 28	Case Study 9: Current Marketing Research Course Overview	HW #9 (Chap. 13)
Group Project Presentations		
Dec. 3	Final Project Presentations (part 1 of 2)	
Dec. 5	Final Project Presentations (part 2 of 2)	
Course Review and Final Exam		
Dec. 10	Course Review – prep for final exam	<i>Final Report</i>
Dec. 17	<i>Course Final Exam</i>	

Lowest homework will be dropped

Project Presentations - 20 min presentation w/ 5 min. Q&A per team

Course Grade:

Project Grade	35
1 st Report (see page 387)	8
2 nd Report (see page 387/388)	8
Final Presentation	4
Final Report (page 388-390)	10
Team Effort (by team members)	5
Case Study	20
Group Presentation of Material to Class	8
Case Study Quizzes	8
Class Participation	4
Homework	20
8 homeworks x 2.5 pts each	20
Final Exam	25
Written Exam (details TBD)	25

All students are required to read assigned book chapters or supplemental readings before class.

All students are expected to participate in class discussions.