ENME 426 Production Management  
Fall, 2015, Syllabus

Course Administration  

Instructor:  
Professor Jeffrey W. Herrmann, Department of Mechanical Engineering and Institute for Systems Research  
Office: Martin Hall Room 0151B  
Phone: 301-405-5433  
e-mail: jwh2@umd.edu.  

Class Meeting Times: Monday, Wednesday 2:00 - 3:15.  
Room: Physics 1402  
Office Hours: Monday, Wednesday 12:30 - 2:00, and by appointment.  


Expectations  

Ethical behavior is important to society, and it is the right thing to do. Engineers are expected to behave ethically.

Academic integrity is an important value for our community. Because of this, we have high standards for behavior. Academic dishonesty is prohibited. All students are subject to the requirements of the Code of Academic Integrity and are responsible for upholding these standards for this course. It is very important for all students to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. If you have any questions about whether something is unauthorized, please contact the instructor.

To further exhibit your commitment to academic integrity, remember to sign the Honor Pledge on all examinations and assignments: "I pledge on my honor that I have not given or received any unauthorized assistance on this exam or assignment."

Course Content  

This course covers the basic concepts, models, and intuition needed to design and control manufacturing systems. The course covers the history of manufacturing, production lines, manufacturing planning systems, supply chains, and lean manufacturing as well. Students will learn to identify the components of process and flow variability, how to measure these, and how to use models to predict their influence on manufacturing system performance. Students will learn the key parameters and performance measures of manufacturing systems.

The course also introduces spreadsheet-based end-user modeling as an approach for gaining insight into manufacturing system behavior, and students will be able to create effective spreadsheet-based end-user models of manufacturing systems.

Course Outline (with related material in text)  

- Factory Physics? (Chapter 0)  
- Manufacturing in America (Chapter 1)  
- Factory Measurements and Dynamics (Chapters 6 and 7)  
- Variability (Chapters 8 and 9)  
- Push and Pull Production Systems (Chapter 10)  
- MRP and Production Planning (Chapter 3)  
- Capacity Management (Chapter 18)  
- Lean Manufacturing  
- Inventory and Supply Chain Management (Chapters 2 and 17)

Learning Objectives  

Students who complete this course will be able to do the following:
• Describe the history of manufacturing in America;
• Estimate processing time variability in the presence of setups and rework;
• Estimate the parameters of a manufacturing system;
• Define and apply Little’s Law;
• Analyze the best- and worst-case performance of a manufacturing system;
• Estimate the cycle time of a manufacturing system;
• Explain how variability degrades system performance;
• Identify time, capacity, and inventory buffers;
• Analyze a CONWIP manufacturing system;
• Identify the components of manufacturing planning systems;
• Determine the required capacity of a manufacturing system;
• Apply inventory management models;
• Define the concepts of supply chain management;
• Identify variability, buffers, and waste in a manufacturing system;
• Explain the principles and techniques of lean manufacturing;
• Design and build an accurate, easy-to-use spreadsheet-based end-user model.

Lectures and Class Discussion

Most class sessions will be a combination of lectures, class discussion, and active learning activities (including simulations and problem solving). Reading assignments will be announced beforehand so that students can prepare for the class. Attendance at these sessions is suggested (but not required). Audio recordings of class sessions will be posted on the course website.

Homework

Problems from the textbook and old exams will be suggested as homework that can be used for learning the material and practicing problem-solving skills; completing these is NOT required, and they will NOT be graded; solutions will be provided.

Spreadsheet Modeling Exercises

On selected dates during the semester (see the course calendar), we will have in-class spreadsheet modeling exercises. Attendance at these sessions is mandatory, and every student should bring a laptop that can run Microsoft Excel. At the end of each session, every student will submit their spreadsheets and will receive feedback. After the last session, each student will receive a spreadsheet modeling evaluation grade.

Process Observation Assignment

Every student will submit a two-page memo that describes a manufacturing system and the variability, buffers, and waste in that system. Additional details will be announced.

Manufacturing Simulations

Students will form teams of four to perform two online manufacturing simulations. These are required activities. At the end of each simulation, every student will complete a short report describing the team’s actions, their performance, and their teammates’ contributions to team success. Additional details will be announced.

Examinations

Please see the course schedule for the dates of the midterm and final exams. Each exam will be a combination of problem solving and short-answer questions. The exams are closed-book, closed-notes.

Grading

Student grades will be based upon the process observation assignment, two simulation reports, a spreadsheet evaluation, a midterm examination, and a final examination.

• Spreadsheet modeling evaluation: 10 points.
• Process Observation Assignment: 20 points.
• Simulation 1 (Capacity Planning): 5 points.
• Simulation 2 (Response Time): 5 points.
• Midterm Exam: 25 points.
• Final Exam: 35 points.

Absences

Any student who will be absent for a medical reason when an assignment is due, for a spreadsheet modeling exercise, or an exam must notify the instructor in advance and subsequently provide documentation of illness from a health care professional. The student is still responsible for the assignment and will complete it as soon as possible.

Any student who will be absent for religious observances should notify the instructor in advance. The student is still responsible for the assignment and will complete it as soon as possible.

Letter Grades

Each student will earn a letter grade based on the number of course points that the student has earned. Each letter grade (with a plus or minus) requires the following number of course points.

- 97 = A+
- 93 = A
- 90 = A-
- 87 = B+
- 83 = B
- 80 = B-
- 77 = C+
- 73 = C
- 70 = C-
- 67 = D+
- 63 = D
- 60 = D-
- less than 60 = F

Policies on Electronic Devices

Students may use a calculator when taking the midterm and final exams. The use of laptops, tablets, smart phones, or other devices is prohibited during the exams.

Electronic devices can be distractions during class; except for the days of the spreadsheet modeling exercises, their use during class is discouraged in order to maintain an effective environment for learning. Students who do want to use them to take notes or refer to course materials should use them in a way that does not distract others. Do not view videos, check email, chat, or otherwise divert yourself or others. Do not record class sessions.