IE 367
PRODUCTION PLANNING AND CONTROL
FALL 2018

Instructor: Dr. R. Logen Logendran
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Office Hours: T, Th: 12:00 – 1:00 p.m. Other times by appointment; please call or e-mail.
Class Schedule: T, Th: 10:00 – 11:50 a.m.
Prerequisite: IE 255 or ST 314
Revision Date: September 19, 2018


Course Website: http://classes.engr.oregonstate.edu/mime/fall2018/ie367/

Catalog Description

Forecasting techniques, inventory analysis, master production scheduling, material and capacity requirements planning, and scheduling methods.

Course Learning Outcomes

1. Describe (identify/write) the need to learn about the various functions in production planning and control to better manage manufacturing and/or service systems.
2. Show (write) how qualitative and quantitative forecasting techniques can be used in short, medium, and long range forecasting.
3. Develop (write) master production schedules (MPSs) and perform rough-cut capacity planning to determine if the MPSs are realizable.
4. Develop (write) material requirements plans (MRP-I), manufacturing resource plans (MRP-II), and capacity requirements plans (CRP) as part of resource requirements planning systems.
5. Show (write) how various heuristic decision rules can be used to make lot-sizing decisions.
6. Develop (write) quantitative models to manage independent demand inventory systems.
7. Show (write) how various order sequencing rules can be used to improve the performance on the shop floor.
8. Show (write) how various heuristics can be used to solve industry-size line balancing problems.
9. Using the concepts of Course Leaning Outcome 2, work as a team of 4-5 students on an open-ended (computer project) problem on financial planning to produce a team-written report to effectively communicate the responses to a series of questions.
10. Using the concepts of Course Leaning Outcomes 3-7, work as a team of 4-5 students on an open-ended (term project) problem on the production of three primary products, both with and without machine capacity constraints, to produce a team-written report to effectively communicate the responses to a series of questions.

Lecture Material

*Chapters 1 and 2*
Introduction, course overview

*Chapter 3*
Introduction to Forecasting; Qualitative and Quantitative Forecasting Methods/Models; Single Variable and Multiple Variable Forecasting Models for Long-Range Forecasts; Seasonality in Time Series Forecasts; Moving Average, Weighted Moving Average, and Exponential Smoothing Techniques/Models for Short-Range Forecasts; Controlling Forecasting Models. *Weeks 1 - 3*

*Chapter 13 and Chapter 15*
Master Production Scheduling (MPS); Determination of a Suitable Planning Horizon for MPS; Rough-Cut Capacity Planning; Resource Requirements Planning; Inputs and Outputs of a Resource Requirements Planning System; Material Requirements Planning (MRP); Dependent vs. Independent Demand; Behavior of Inventory in EOQ/OP vs MRP; Advantages of Using MRP; Elements of MRP - Master Production Schedule (MPS), Bill of Materials File and Inventory Status File; MRP System; Lot sizing in MRP - Produce-to-Order vs. Produce-to-Stock; Net Change vs. Regenerative MRP Systems; MRP in Assemble-to-Order Firms; Manufacturing Resource Planning (MRP-II); Capacity Requirements Planning; Load Schedule. *Weeks 3 - 5*

*Chapter 14*
Introduction to Independent Demand Inventory Systems; Fixed Order Quantity and Fixed Order Period Systems; Classical EOQ Models; EOQ Models with Gradual Deliveries; EOQ Models with Quantity Discounts; Lead Time, Safety Stock, Order Point, Probability of Stockout, and Service Level; Single Period Models; ABC Classification of Materials; Make vs. Buy Decisions. *Weeks 6 - 7*

*Chapter 16*
Introduction to Scheduling and Shop Floor Planning and Control; Order Sequencing Rules and Their Performance Based on Different Evaluation Criteria; Changeover Costs and Job Sequence; Sequencing n Jobs Through Two Work centers - Johnson's Rule. *Week 8*

*Chapter 5*
Introduction to Line Balancing; Techniques for Analyzing Line Balancing Problems; Application
of Incremental Utilization and Longest-Task-Times Heuristics.  

Week 9  

Review  

Week 10  

Projects:  

Computer Project on forecasting.  
Term Project on Manufacturing Resource Planning (MRP-II), using Microsoft-Excel.  

Grading Policy:  

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<thead>
<tr>
<th>Test/Exam</th>
<th>Weight</th>
<th>Schedule</th>
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<tbody>
<tr>
<td>Test 1</td>
<td>20%</td>
<td>Thursday, October 25</td>
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<tr>
<td>Test 2</td>
<td>20%</td>
<td>Thursday, November 15</td>
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<tr>
<td>Final Exam</td>
<td>25%</td>
<td>Thursday, December 6 (9:30 – 11:20 a.m.)</td>
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<tr>
<td>Homework and</td>
<td></td>
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<tr>
<td>Computer project</td>
<td>15%</td>
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<tr>
<td>Term project</td>
<td>20%</td>
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</tbody>
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- Seeking assistance from students who had taken this course before and/or acquiring materials/solutions they had access to when they were enrolled in the course, including work of their own, are strictly prohibited.

- During class, the use of cell phone/iPad to surf the web, to check emails, and/or to send/receive texts is strictly prohibited.

- During class, leaving and entering the classroom is strictly prohibited.

- During class, engaging in conversations with your neighbor or conducting yourself in a manner that is disruptive to the class is strictly prohibited.

- Arriving late to class or leaving early is strictly prohibited.

- **Attendance in class is a MUST.** Students who are unable to attend a class due to an illness or another valid reason must keep the instructor notified via email. In other words, perfect attendance is required unless there is a valid reason for missing a class, notified by email.

HOMEWORK: Individual effort  

COMPUTER PROJECT AND TERM PROJECT: Group effort. Each student in a group is required to work jointly with the rest of the group by contributing their share of effort in the pursuit and completion of the computer project and term project. If a student is found not to make his/her share of contribution, the rest of the group MUST bring the matter to the attention of the instructor immediately. If evidence of such non-contribution was found, the instructor
will remove the student from the group and ask him/her to work independently on the project and turn in a report.

1. Tests 1 and 2 and the Final Exam will be given on the dates indicated above. Students viewing the test at the scheduled time are considered to have taken the test. There is no makeup for these tests.
2. Assignments must be turned in at 11:50 a.m. (or as specified in class) on the due date. Late assignments will not be accepted.
3. Grades will be given on a +/- basis, using 90, 80, 70, … as cutoffs for A, B, C, …and so on.
4. A student’s academic record is a relatively permanent record of that student’s performance and activities while in school. It is important that each student and the integrity of each student’s record be protected.
5. Students are responsible for any changes to this syllabus announced in class. These can be in the form of discussions/announcements in class and/or communications via email to the entire class list.

STUDENT CONDUCT AND COMMUNITY STANDARDS
Students are held responsible for detailed Student Conduct and Community Standards listed at: http://studentlife.oregonstate.edu/studentconduct/offenses-0#offenses.

Specifics on Academic or Scholarly Dishonesty, and Expectations are also listed below.

ACADEMIC OR SCHOLARLY DISHONESTY:
Students are required to be honest and ethical in their academic work.
576-015-0020 (2) Academic or Scholarly Dishonesty:

   a) Academic or Scholarly Dishonesty is defined as an act of deception in which a Student seeks to claim credit for the work or effort of another person, or uses unauthorized materials or fabricated information in any academic work or research, either through the Student's own efforts or the efforts of another.
   
   b) It includes:
   
(i) CHEATING - use or attempted use of unauthorized materials, information or study aids, or an act of deceit by which a Student attempts to misrepresent mastery of academic effort or information. This includes but is not limited to unauthorized copying or collaboration on a test or assignment, using prohibited materials and texts, any misuse of an electronic device, or using any deceptive means to gain academic credit.

(ii) FABRICATION - falsification or invention of any information including but not limited to falsifying research, inventing or exaggerating data, or listing incorrect or fictitious references.

(iii) ASSISTING - helping another commit an act of academic dishonesty. This includes but is not limited to paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, taking a test/doing an assignment for someone else by any means, including misuse of an electronic device. It is a violation of Oregon state law to create and offer to sell part or all of an educational assignment to another
person (ORS 165.114).
(iv) TAMPERING - altering or interfering with evaluation instruments or documents.
(v) PLAGIARISM - representing the words or ideas of another person or presenting someone else's words, ideas, artistry or data as one's own, or using one's own previously submitted work. Plagiarism includes but is not limited to copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project and then submitting it as one's own.

Academic Dishonesty cases are handled initially by the academic units, following the process outlined in the University's Academic Dishonesty Report Form, and will also be referred to SCCS for action under these rules.

When evidence of academic dishonesty comes to the instructor's attention, the instructor will document the incident, permit the accused student to provide an explanation, advise the student of possible penalties, and take action. The instructor may impose any academic penalty up to and including an "F" grade in the course and inform the student of the action taken.

EXPECTATIONS:
The goal of Oregon State University is to provide students with the knowledge, skill and wisdom they need to contribute to society. Our rules are formulated to guarantee each student's freedom to learn and to protect the fundamental rights of others. People must treat each other with dignity and respect in order for scholarship to thrive. Behaviors that are disruptive to teaching and learning will not be tolerated, and will be referred to the Student Conduct Program for disciplinary action. Behaviors that create a hostile, offensive or intimidating environment based on gender, race, ethnicity, color, religion, age, disability, marital status or sexual orientation will be referred to the Affirmative Action Office.