**Production Planning and Scheduling (EMGT 372)**

**Spring, 2013**

**Class Meetings: TR 11-12.15; BCH 316**

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**Objectives:**  This course is designed to introduce you to planning processes required for smooth operations in production systems. The following topics will be covered in detail.

1. Fundamental ideas underlying production systems (Chapters 1 and 2)
2. Forecasting of product demand (Chapter 3)
3. Strategic decision-making in supply chains (Chapter 4)
4. Inventory management (Chapter 6)
5. Push and Pull systems (Chapters 7 and 8)
6. Lean Manufacturing (Chapter 10)
7. Shop scheduling (Chapter 11)

By the end of the semester, you should be able to:

1. Clearly describe the role played by inventory in the production planning process.
2. Develop forecasts for future production.
3. Define a supply chain and its key elements; also define its impact on the production planning process.
4. Develop fundamental models for inventory control.
5. Define strategies used to make production systems lean.
6. Develop schedules in production shops.

**Textbook: “Designand Analysis of Lean Production Systems”** by R. G. Askin and J. B. Goldberg, John Wiley and Sons.

Course material will be approximately 100 % from the book. The syllabus is described in detail below.

**Evaluation Plan:**

Evaluation will be done on the basis of performance in examinations and homework.

First Exam: 35 %

Homework Assignments (30 %)

Second Exam: 35 %

Quizzes: 0% (No grade).

 **Course Syllabus:**

Chapter 1: All sections excepting for Section 1.5

*Problems:* 1.1, 1.2, 1.3, and 1.7.

Chapter 2: All sections

*Problems:* 2.1 to 2.7, and 2.10 to 2.15, 2.17, 2.18 to 2.20, 2.23, and 2.24.

Chapter 3: 3.1 (exclude Section 3.1.1.1), 3.2 (only sections 3.2.1), 3.3 (only section 3.3.1), 3.4, and 3.5

*Problems*: 3.1, 3.2, 3.5, 3.6, 3.8, 3.9, 3.14, 3.29, and 3.30.

Chapter 4: All sections excepting for: Sections 4.1.2.3, 4.1.2.4, 4.2.6, and 4.3.

*Problems*: 4.1 to 4.8.

Chapter 6: Sections 6.1 (only Sections 6.1.1), 6.2 (only the following subsection: 6.2.2 until and including Example 6.9; 6.2.3.1 until and including Example 6.10 and 6.2.3.2 until and including Example 6.13).

*Problems:* 6.1-6.4, 6.33 (lead time is 1week), and 6.36.

Chapter 7: Section 7.1, in 7.2 only the following subsections: 7.2.2; 7.2.7.2; and 7.2.9.

*Problems*: 7.1 to 78, 7.13, and 7.16a, 7.17, 7.18, 10.2, 10.9, and 10.10.

Chapter 8: All sections excepting for Sections 8.3.2, 8.3.3 and 8.4 and 8.5.

*Problems*: 8.1 to 8.5, 8.8 (9n 8.8a replace EOQ by EMQ), 8.11 and 8.14.

Chapter 10: All sections excepting for Sections 10.2.7, 10.3.1, 10.3.2, 10.3.3, 10.3.4 and 10.3.5; also exclude Example 10.12. Additional material on takt times (online).

*Problems*: 10.1 to 10.6, 10.9, and 10.10.

Chapter 11: All sections excepting for Sections 11.2.2, 11.3.3, and 11.6.

*Problems:* 11.14 a and b, 11.19 b, 11.21, 11.24a.

**A link between the main contents and the chapter in the book:**

1. **Definition of a production system** and **an industrial enterprise**; Production Processes, the importance of profit margins, competitiveness measures, and the ability to survive and thrive in the market. (CHAPTER 1).
2. **Some basic concepts related to production systems**: Classification of production systems on the basis of (a) Layouts (process, product, cellular and fixed-position), (b) inventory control (push or pull), (c) Labor Vs Capital; decision-making at three levels (strategic, tactical, and operational); importance of inventory in the system*;* calculation of lead time and inventory (Little’s rule); inventory turns; modeling and the systems approach. (CHAPTER 2)
3. **Forecasting of demand**. (CHAPTER 3).
4. **How much raw material should be ordered and when**: EOQ, (Q,r) policies, Order up-to-R policies, and the newsboy model (CHAPTER 5).
5. **Moving material on the shop floor**: Kanban control (CHAPTER 7), MRP systems (CHAPTER 8), and scheduling (CHAPTER 11).
6. **Supply chain management**: core competencies of a firm, Make or buy, MTO or MTS, relationships between retailers and suppliers, the bullwhip effect, cross-docking, and vendor-managed inventory (CHAPTER 4).
7. **Overview of lean manufacturing**: lead time and inventory measurement and reduction. (CHAPTER 10).

**A Tentative Schedule**

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| *Date* | *Event* |
| Jan 22 | First day of classes |
| Feb 26 (6th week) | HW 1 due (2.6, 2.7, 2.12, 2.13, 2.15, 2.23, 2.24, 3.1, 3.8, 3.30) |
| March 5 | First Mid-Term Exam [Chapters 1, 2, 3,4 ] |
| March 12 | St. Pat Break |
| March 26-30 | Spring Break |
| May 2 (14th week) | Spring break HW 2 due (4.3, 4.4, 4.6, 4.8, 6.3, 6.33 (lead time is 1 week), 7.2,7.7,7.16a,7.17,7.18, and 8.5) |
| May 9 | Second Mid-term Exam [Comprehensive] |

**Class Policies:**

1. Late assignments will not be accepted under normal circumstances.
2. Makeup exams will not be given unless there is a medical emergency for which proof will be required.
3. The final examination will be held as per schedule, and no adjustment will be made for any travel plans of students. Hence those students who want to leave the campus after the semester must make their plans according to the regular schedule of the university.
4. The rules regarding academic dishonesty are at: <http://registrar.mst.edu/academicregs>
5. *If you have a documented disability and anticipate needing accommodations in this course, you are strongly encouraged to meet with me early in the semester. You will need to request that the Disability Services staff* (<http://dss.mst.edu>) *send a letter to me verifying your disability and specifying the accommodation you will need before I can arrange your accommodation.*
6. The purpose of the Academic Alert System [http://academicalert.mst.edu](https://minermail.mst.edu/exchweb/bin/redir.asp?URL=http://academicalert.mst.edu/) is to improve the overall academic success of students by improving communication among students, instructors and advisors; reducing the time required for students to be informed of their academic status; and informing students of actions necessary by them in order to meet the academic requirements in their courses. I will use the academic alert system in case of problems.

***Good luck and have a great semester!***