

IT 410 - Operations Planning and Control Spring 2014

Dr. Eric Olsen
Bldg 03 Rm 435
Office: 805 756-1754
Email: eolsen@calpoly.edu

Assoc Prof of Industrial and Packaging Technology
Office Hours: 2-4 pm Mon or by appointment
Course Web Address: see PolyLearn
Website: <http://www.cob.calpoly.edu/faculty/eric-olsen/>

COURSE CONTENT

IT 410 Operations Planning and Control (4)

Linking supply chain operations to deliver value to the end customer. Contrasting of advanced manufacturing concepts, such as pull systems, sales and operations planning, mixed model manufacturing, level production, and theory of constraints to traditional materials requirements planning systems. 3 lectures, 1 activity. Prerequisite: IT 341 or IT 371 and BUS 391.

The course will present a general management perspective on the **use of planning and control systems to manage the flow of material in operations**. Operations planning and control is an **integrative function** in a business that is critical in **linking the planning activities in many areas of the business, e.g. in marketing, operations, finance, and engineering**.

In particular, this course will emphasize the overall structure of the planning and control function in managing operations, how this function coordinates activities within the operations area, and how operations planning and control decisions relate to other functional areas in the business. While material in the course is **directed toward manufacturing industries**, it is **also applicable to service industry operations**.

The course includes the following modules: i) Sales and Operations Planning, ii) Master Production Scheduling, iii) Material and Capacity Planning, iv) Shop Scheduling Systems for Batch Production Processes, and v) Operations Planning and Control Systems For Just-In- Time (Lean) Production Processes.

LEARNING GOALS AND OUTCOMES

Related – IT Program Learning Goals

- LG1:** Demonstrate general knowledge within their area of interest in Industrial Technology.
- LG4:** Act upon decision tools and methods and explain the action taken.
- LG7:** Demonstrate effective technical written communications skills

Course Learning Outcomes After completing this course, you should be able to:

1. **Understand the structure of modern operations planning and control systems (LG#1)**
2. Understand **when and where** particular planning and control approaches are appropriate in operations (LG#1)
3. Understand the **conceptual basis** for operations planning and control systems (LG#1)
4. Make operations planning and control **decisions based on the appropriate data (LG#4)**
5. **Write up** a production planning and control case and **support your decision (LG#4 and #7)**
6. Use appropriate **computer spreadsheets** and tools to support production planning and control decisions (LG#4).

COURSE OUTLINE

<u>Block</u>	<u>Topic</u>	<u>Assignment</u>
1	Course Overview - Manufacturing Competitiveness / MPC Framework	PP&C Ch 1 all, (Lab Ch 11 – Economic Order Quantity Model pp 310-312)
MODULE I: MANAGING DEMAND / SALES AND OPERATIONS PLANNING		
2	Sales and Operations Planning – Introduction	PP&C Ch 4 pp 62-68
C1	Forecasting example	Wilkins Forecasting Case PP&C Ch 3 pp 29-36
3	Logic and Structure of S&OP	PP&C Ch 4 pp 68-79
4	Spreadsheet analysis	PP&C Ch 4 pp 79-85, Problems 1, 2, 3, 4
5	Inputs to S&OP	PP&C Ch 4: Problems 13, 16, 17, 18
C2	S&OP example	Wilkins Aggregate Planning Case PP&C Ch 11 – Order Timing Decisions (safety stock) pp 312-320
MODULE II: MASTER PRODUCTION PLANNING		
6	MPS Records and Customer Order Promising	PP&C Ch 5 pp 116-126, Problems 2, 3, 4, 5
7	Capacity Constraints and Managing the MPS	PP&C Ch 5 pp 126-134, Problems 6, 7, 8, 9
MODULE III: MATERIAL AND CAPACITY PLANNING		
8	Material Requirements Planning: MRP Records	PP&C Ch 6 pp 146-159, Problems 4, 5
9	MRP: Product Structure and Bill of Material Explosion	PP&C Ch 6 pp 159-169, Problems 1, 2, 3, 6, 7, 8
C3	MRP example	Wilkins MRP Case
10	MRP Transactions	PP&C Ch 6 pp 169-174, Problems 12, 13, 14
11	Capacity Planning Techniques	PP&C Ch 7 pp 204-215, Problems 1, 2, 5, 6, 7
12	Capacity Management	PP&C Ch 7 pp 215-228, Problems 8, 9, 11
MODULE IV: SHOP SCHEDULING SYSTEMS FOR BATCH PRODUCTION PROCESSES		
13	Batch Manufacturing: Scheduling Methods	PP&C Ch 8 pp 236-244, Problems 1, 2, 5, 8, 10
14	Batch Manufacturing: Scheduling Systems	PP&C Ch 8 pp 244-249, Problems 9, 13, 17
15	Theory of Constraints (TOC) Systems	PP&C Ch 8 pp 249-256, Problems 11, 18 (Ch 11 – ABC Analysis pp 321)

MODULE V: OPERATIONS PLANNING AND CONTROL FOR JIT PRODUCTION PROCESSES

16	Just-in-Time Manufacturing	PP&C Ch 9 pp 269-281, Problems 1, 2, 5, 7
17	Planning and Control Under JIT	PP&C Ch 9 pp 282-296, Problems 3, 4, 12, 13

Notes:

1. **Assigned readings and problems are to be completed by the student prior to the session.** Additional support for learning the material will be provided in the lectures and laboratory sections.
2. The online **“reading quiz”** on PolyLearn usually should be **completed by 11pm the Tuesday BEFORE the Friday quiz** on a chapter or portion of a chapter. Check the quiz due dates on PolyLearn. ***The reading quizzes cannot be made up. Do not ask me.*** They count as part of class participation.
3. “Blocks” may cover more or less than one class period.
4. Adjustments to the course outline may be made to facilitate effective learning. **Students are responsible for any changes made in class or on PolyLearn.** Adequate notice will be given.
5. Each module will include a quiz to evaluate student performance (see below).
6. Lab sessions are provided each week to help students with the concepts and assigned problems. It is essential that students ***have completed the problems to the best of their ability prior to the lab session*** for that week. Due to time constraints, the lab instructor will only be able to work through representative or “problem” problems. Bring your questions to class, lab, and office hours.
7. Homeworks and **cases** can be turned in **up to 2 weeks late** for partial credit.
8. **Grading issues on quizzes or homeworks must be addressed before the next module quiz.**

COURSE MATERIALS

Required:

Production Planning and Control IT410 Professor Eric Olsen, ISBN: 9781121944138, McGraw-Hill, comprises of outside cases and selected chapters from:

Jacobs, F. R., Berry, W. L., Whybark, D. C., & Vollmann, T. E. 2011. Manufacturing planning and control for supply chain management (6th ed.). Boston: McGraw-Hill Irwin.

Other readings as assigned.

PERFORMANCE EVALUATION

Grading components:

Module 1 Quiz	*	Fri, Week 3
Module 2 Quiz	*	Fri, Week 5
Module 3 Quiz	*	Fri, Week 7
Module 4 Quiz	*	Fri, Week 9
Module 5 Quiz and Comprehensive Final	*	During final exam period
Class Participation	10	
Total	100%	

Notes:

1. A total of five, 50-minute quizzes will be given in the course to assess each student's mastery of the material.
2. The quizzes include the Module 5 Quiz that is combined with a comprehensive final.
3. * **Only the four highest-grade quizzes will be counted** with a weight of 22.5% each (90% total).
4. Since only four quizzes are required for a final grade, **make-up quizzes will NOT be given and the final time is fixed**. *No consideration will be given for extenuating circumstance make-up quizzes until after you have missed your first quiz.*
5. Additionally, if you take any **APICS** module and achieve at least 290 pts (300 is passing) or Shingo Lean Knowledge certification during the quarter, I will drop the lowest of your four final quizzes and replace it with 100%.

POLICIES AND PROCEDURES

Personal Integrity Policy

Although I do not expect cheating in my classroom, the penalty is an **F for the course**. Cheating occurs when a student looks at another students' work during an exam or obtains help of faculty or students outside their assigned group on assigned homework sets or exams. Plagiarism occurs when students copy large sections of another author's material without referencing it.

Posting Solutions

Complete solutions will NOT be posted. Only partial solutions or check figures will be posted occasionally on PolyLearn. Complete solutions will be shared in lab or class. This provides the students with an incentive for attending lab and class. In addition, it discourages a "pattern matching" approach to solving problems and last minute cramming.

Professional Behavior Guidelines:

- **Tardiness:** Please arrive on time. If you are later than the start of the class, please quietly take a seat nearest the entrance.
- **Side Conversations:** Side conversations make it difficult for your classmates to actively listen and learn.
- **Sleeping:** Get a good night's rest before coming to class. Falling asleep in class is not considered professional behavior.
- **Inattention:** Please do not read other books or newspapers or study for other courses during my class. It's not polite. Please pay attention and join in the individual and group discussions. It will help you master the material.
- **Laptop Computers:** Note taking on laptop computers is allowed in this class. Checking email or doing other work in class is not. In a business meeting doing other work is rude behavior and the same applies in this class. Laptops may be assessed during breaks.
- **Cell or Smart Phones:** Turn them off.
- **Leaving the Classroom:** If you need to exit or re-enter the classroom during class, please do so with a minimum of fanfare. I consider my class adult education. Adults in a business setting should be free to move or stand unobtrusively in the back of the class if it improves their ability to be attentive and contribute. **You will NOT be allowed to leave the classroom during a quiz**, so make appropriate allowances.

Miscellaneous Policies

- *Although I will try to maintain the class schedule and objectives, I may need to make adjustments.*

- While require attendance, I **strongly** urge you to attend class. Otherwise, you will miss exercises and explanations that are essential to learning. It is also part of your participation grade. **You are responsible for anything that is said in class or any changes made to assignments.** Do not e-mail or call me asking “what did I miss.” Find a buddy to share coverage responsibility.
- Your class participation grade results from my quantitative and qualitative evaluation of your engagement in the class. The quantitative portion can consist of occasional completed cases or assignments and attendance in class and lab. The qualitative portion can consist of my subjective evaluation of your preparation for and contributions to class discussion.
- I do not give additional projects to increase one's grade.

The instructor reserves the right to modify this course syllabus as deemed necessary as the class progresses.