# ITP488
## Managing the Supply Chain using Advanced Planning and Optimization Tools

**Instructor**: Richard W. Vawter
**Office**: OHE 530B
**E-Mail**: vawter@usc.edu
**Phone**: (213) 740-9541

**ITP 488**, Fall 2013
**Location**: OHE 542
Wed. 2:00-4:50 p.m.

**Office Hours**: Tues. 11:00 - 12:00 p.m.
Wed. 10:00 - 12:00 p.m.
Thurs. 11:00 - 12:00 p.m.

or by appointment

**Class Web Page**:
https://blackboard.usc.edu/
or
http://www-bcf.usc.edu/~vawter/classes.html

**Course Description:**

This course is designed to provide the student with a thorough understanding of the strategic role of supply chain management (SCM); what drives the supply chain as well as methods for planning and optimizing the supply chain. During the semester, cases and projects will be assigned that afford the student the opportunity to work through many real-life business situations using an SAP SCM system as well as various Advanced Planning and Optimization (APO) tools that are available today. The hand's-on exercises, coupled with the in-class discussions of SCM, will prepare the student with the knowledge sought by businesses looking to use technology to reduce manufacturing costs by managing the supply chain effectively.

**Objective:**

This course is designed for the student who is already familiar with ERP system design and operation. This course will provide the student with a thorough understanding of the strategic role of supply network planning (SNP) - that which drives the demand as well as methods for planning and optimizing the logistics network. The student will focus on the supply network from the point of view of a general manager. During the semester, assignments will require the student to program spreadsheets to control various aspects of the logistics network such as demand forecasting, aggregate planning and inventory management. Cases and projects will be assigned that afford the student the opportunity to work through many real-life business situations using Advanced Planning and Optimization (APO) tools that are available today. Our goal in this course is to understand how logistical decisions impact the performance of the firm as well as the entire supply network.

**Suggested Textbooks (optional):**

1. Supply Chain Management, Strategy, Planning, and Operations, 2nd Edition, by Sunil Chopra & Peter Meindl, Prentice Hall, ©2003, ISBN: 9780131010284
2. Sales and Inventory Planning with SAP APO, 1st Edition, by Marc Hoppe, Galileo Press, ©2007, ISBN: 9781592291236

**Class Schedule:** (*Topics & assignments subject to change, however, midterm date is set*)

| Class | Topic | Suggested Reading | Assignment |
|---|---|---|---|
| 1. Aug. 28 | Course Overview<br>The Supply Chain in General | Hoppe: Ch 2 – Overview of SAP APO | In class – "The Beer Game". |
| 2. Sept. 4 | Overview of Supply Chain Management<br>▪ Performance Goals<br>▪ Process Cycles | Chopra: Ch 2 – Supply Chain Perfor-mance | **Project #1** – Global Bike, due Sept. 11. |
| 3. Sept. 11 | Supply Chain Drivers<br>▪ Performance Drivers<br>▪ Obstacles to avoid | Chopra: Ch 3 – Supply Chain Drivers | **Project #2** – GBI Master Update for SCM, due Sept. 18 |
| 4. Sept. 18 | Demand Forecasting<br>▪ Components to basic forecasting<br>Forecasting models:<br>▪ Moving Averages,<br>▪ Exponential Smoothing,<br>▪ Linear Regression | Chopra: Ch 7 – Demand Forecasting | **Project #3** – Program-ming & Applying Forecasting Models, due Oct. 2. |
| 5. Sept. 25 | Forecasting models (continued)<br>▪ Adaptive (Holt's)<br>▪ Corrected (Winter's) | Chopra: Ch 7 (cont.) | Continue working on Project #3.<br>**Project #4** – Forecasting Demand using R/3, due Oct. 2. |
| 6. Oct. 2 | Integrating ERP with SCM/APO<br>▪ ECC + SCM/APO environments<br>▪ Master data model-ing and transfer | Hoppe: Ch 3 – Demand Planning with APO, Basic Configuration | **Project #5** – Integrating ERP with SCM/APO, due Tuesday, Oct. 8, by 5:00 pm. |
| 7. Oct. 9 | **Midterm**<br>Preparing the Supply Chain Model<br>▪ The Production Data Structure<br>The Supply Chain Engineer | Chopra: Ch 11 – Managing Uncertainty in th Supply Chain<br>Hoppe: Ch 4 – APO-DP, Implementation | **Midterm Project**, due Oct. 16.<br>**Project #6** – The Supply Chain Model, due Oct. 16. |

Labor Day Sept. 3rd

SAP Tech Ed.
Oct. 21st – 25th

| | | | |
|---|---|---|---|
| 8. Oct. 16 | Supply Network Planning (SNP)<br>▪ Overview<br>▪ The interactive SNP desktop | Chopra: Ch 16 – Coordination in the Supply Chain<br>Hoppe: Ch 6.4-6.7 – Planning Method in SNP | **Project #7** – Supply Network Planning, due Oct. 30. |
| 9. Oct. 23 | *No class Wednesday* | none | Cont. w/ Project #7 due Oct. 30. |
| 10. Oct. 30 | SNP Heuristics and Capacity Planning<br>▪ The different SNP heuristics<br>▪ Capacity leveling | Hoppe: Ch 5 – Inventory Planning, Basic Principles<br>Hoppe: Ch 6.1 – 6.2 Inventory Planning, Implementation | **Project #8 –** SNP Planning w/ Capacity Leveling, due Nov. 6. |
| 11. Nov. 6 | Deployment and the Transport Load Builder<br>▪ Deployment planning horizons<br>▪ TLB profiles | Chopra: Ch 13 – Sourcing Decisions in the Supply Chain<br>Chopra: Ch 14 – Transportation in the Supply Chain | **Project #9 –** Deployment and the TLB, due Nov. 13. |
| 12. Nov. 13 | Capable to Match<br>▪ Advantages<br>▪ Quotas vs Priorities | Chopra: Ch 16 – Coordination in the Supply Chain<br>Hoppe: Ch 6.4-6.7 – Planning Method in SNP | **Project #10 –** Capable-to-Match, due Nov. 27. |
| 13. Nov. 20 | Optimization in SNP<br>▪ Optimizing costs<br>▪ Comparing SNP strategies | Hoppe: Ch 6.3 – Optimization in SNP<br>Chopra: Ch 12 – Optimal Level of Product Availability | **Final Project** – due Friday, Dec. 6th, by 5:00 pm. |
| 14. Nov. 27 | **Thanksgiving Holiday** | | |
| 15. Dec. 4 | Transportation and Vehicle Scheduling Course Review | Class Notes | Final Project due Friday, Dec. 6th, by 5:00 pm |

**Lab Policies**

- The SAP GUI is installed on the computers in all ITP computer labs. In the third week of class, ITP computer labs and hours will be posted at: http://itp.usc.edu/labs/
- Lab assistants are not familiar with SAP, nor with class assignments, so please don't expect them to be able to help answer questions regarding the projects.
- **Note**: Before logging off any lab computer, you must ensure that you have either emailed or saved your work on a flash drive which you created during your time in the lab. Any work saved to the computer **will be erased** each evening and after restarting the computer. The School of Engineering is not responsible for any work lost.

**Project Assignments**

- Projects will be available via the "Assignments" section of the class web site.
- It is **your** responsibility to turn in the assignments at the beginning of lecture on the dates indicated above and verify that your assignment is in the class "assignment box".
  - You are to only turn in the "Answer sheet" and "Summary" portion of the assignment as one document.
  - You are to submit your "Answer sheet + Summary" document via the "Assignments" section of the class web site (from where you originally obtained the project write-up).
  - You are to also verify that your document is in the class "assignment box" AND double-click on it to open it up. If you can't see, or open the document you submitted, then neither can the grader!
  - **After the second project, failure to correctly submit projects will result in a 5% penalty.**
- Assignment Answer Keys will be posted on the Class Assignments Web page immediately following the projects' due dates and times.

**Late Assignments**

- The "Assignments" section of the class web site "closes" after the due date and time.
  - You will no longer be able to submit your assignment and your assignment will be considered late - no exceptions!
  - Late assignments must be e-mailed to me directly (vawter@usc.edu); not the grader.
  - I will make a note of having received your late assignment and then forward the assignment on to the class grader for grading.
  - If I do not have a copy of your project, you will not receive any credit.
- **Assignments that are turned in after the deadlines will automatically have ½ of the possible points deducted prior to grading**. So, please turn in your assignments at the beginning of lecture on the dates indicated above!
- **No assignments will be accepted for credit after 2 weeks beyond the assignment's original due date nor after the last day of the semester (Dec. 6).**
- Please note: **No late Midterm or Final Projects will be accepted for credit.**

**Steps for Handling Assignment Questions**

1. Re-read the instructions carefully and try referring to: http://help.sap.com
2. Review the "Discussion Board" section of the class web site's forum for other students' questions and comments or post a question yourself to begin the forum.
3. Ask the Course TA your question. Please note, however, the TA can only guide you to a solution, the TA is not there to do the project for you.
4. And, of course, you're always welcome and encouraged to stop by my office during my office hours or contact me and arrange for an appointment.

Please note: **I do not address "assignment homework problems" via e-mail**. I am happy to discuss the questions with you, and guide you to solving them yourself during my office hours; but **my e-mail address is not to be used as a simple "help desk"**.

**Examinations:** Exams cover material from the reading assignments, lectures, and lab projects. They will be of the form: multiple choice, and short answer. The exams are both closed book and closed notes. The exams will include material presented up to the date of the exam. The Final exam will be cumulative, including general material presented during the first half of the semester. However, the Final exam will be weighted more heavily with questions from the second half of the semester.

| | | | | |
|---|---|---|---|---|
| Midterm date: | Wednesday, | Oct. 9, | 2:00 - 3:20 p.m. | in room OHE 542 |
| Final Exam date: | Friday, | Dec. 13, | 2:00 - 4:00 p.m. | in room OHE 542 |

**Note**: **No make-up exams will be offered nor will there be any changes made to the Final Exam schedule as established by the University**.

**Grading:**

| | |
|---|---|
| Ave. of Projects | 30% |
| Midterm | 20% |
| Midterm Project | 10% |
| Final Exam | 25% |
| Final Project | 15% |
| | 100% |

**Grading Scale:**

| | |
|---|---|
| 94% and above | A |
| 90% - 94% (not including 94%) | A- |
| 87% - 90% (not including 90%) | B+ |
| 83% - 87% (not including 87%) | B |
| etc. | |

**Students with Disabilities**

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to your lab assistant) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. – 5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

**Student Conduct:** (Excerpts taken from *SCampus Student Guidebook, 2012-2013*)

Excerpt taken from *SCampus Student Guidebook:*

> *The use of unauthorized material, communication with fellow students during an examination, attempting to benefit from the work of another student, and similar behavior that defeats the intent of an examination or other class work is unacceptable to the University. It is often difficult to distinguish between a culpable act and inadvertent behavior resulting from the nervous tension accompanying examinations. When the professor determines that a violation has occurred, appropriate action, as determined by the instructor, will be taken.*

Although I encourage working together, all work claimed as yours must in fact be of your own effort. Students who plagiarize the work of other students or provide material for another student to copy, will receive zero points and **will immediately be referred to** the Student Judicial Affairs and Community Standards (SJACS) board for further action. If SJACS determines the student violated the ethics codes, **the student will receive an F** in the course as suggested by the University. This is non-negotiable!!

The School of Engineering adheres to the University's policies and procedures governing academic integrity as described in SCampus. Students are expected to be aware of and to observe the academic integrity standards described in SCampus, and to expect those standards to be enforced in this course.

**All students must read, understand, and abide by the University Student Conduct Code listed in SCampus, and available at:**
http://www.usc.edu/student-affairs/SJACS/nonacademicreview.html

Additional excerpts taken from *SCampus Student Guidebook, 2012-13*:

§11.00 Behavior Violating University Standards and Appropriate Sanctions
"…individual work will be submitted [by the student], and [it's the student's] obligation both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own."

§11.11 Plagiarism (Definition)
"The submission of material authored by another person but represented as the student's own work, whether that material is paraphrased or copied in verbatim or near verbatim form."

§11.14 Plagiarism (Definition continued)
"Obtaining for oneself or providing for another person a solution to homework a project or other assignments, or a copy of an exam or exam key without the knowledge and expressed consent of the instructor."