

Fall, 2004

MGRS 461 ADVANCED OPERATIONS MANAGEMENT

Tues., Thurs. 1:00 – 2:15

BB 109

Dr. Ron Tibben-Lembke

Office: BB311A

Office Hours: Tues, Thurs: 2:30-3:30

Phone: (775) 784-6993 x318

Fax: (775) 784-1769

Email: rtl@unr.edu

Homepage: <http://unr.edu:80/homepage/rtl>

Course Materials

1. *Forecasting ProSim Production* handout from bookstore
2. *The Goal*, by Eliyahu Goldratt and Jeff Cox
3. An Operations Management textbook from MGRS 352 (you'll need it a lot)
4. Supplemental Materials will be made available on my homepage; address is above

COURSE OBJECTIVES: The objective of the course is for students to learn more advanced methods for dealing with a production environment. No matter where you work in the Logistics field, you will either be supplying materials to a production organization, or distributing the results of a production organization. Either way, you have to have a thorough understanding of the way production environments operate in order to survive.

COURSE GOALS: To meet this objective, we will focus our attention in a number of areas:

- forecasting -- predicting future needs for product
- aggregate planning -- determining workforce needs
- production planning -- which products to plan to produce when
- job scheduling -- what jobs to produce on which machines each day
- worker assignment -- getting the most from your people
- machine reliability -- the importance of maintaining productive capacity
- quality control -- the importance of producing quality products
- simulation -- seeing what might happen and likely outcomes of proposed actions

METHODS: To study this material, we will use a number of different approaches:

- lectures -- no escaping it, there will be a lot of these
- simulation exercises -- you learn by doing
- student presentations -- you learn by explaining things to others

GRADING: Your grade will be determined by your performance in the following areas:

- ProSim: Quiz 5 %
- Test 20 %
- Performance / Participation 10 %
- *The Goal*: Presentation: 5 %
- Test: 15 %
- Cases and Homework 15 %
- Forecasting Exam 10 %
- Final Exam 20 %

Tests: Most test questions will be in problem form, with exact solutions. However partial credit will be given in cases where the error was computational and not conceptual. There may be some true/false or multiple-choice questions. There may be questions which require short (one or two sentences) written answers. Tests and Final Exam will be open-note, but the ProSim quiz will not. Students may use calculators, but no laptop computes, and definitely not the work of another student.

Presentation on *The Goal*: Throughout the semester, we will be reading "The Goal," a novel about manufacturing. Each student will be responsible for helping the class understand what happened in a few chapters. You will present 3-5 chapters with another student, and the two of you should work together to create the slides and prepare the presentation. You should try to have equal quantities of material to present.

These presentations should be professional and succinct. Your job is to help us understand: 1. exactly what happened, and 2. why this is important, which may require you to remind us of past events that lead up to the current event. You should be brief and to the point (no more than 10 minutes), but still give a complete description of the major events of the chapters. Most of our attention will focus on Alex's adventures at work, but there will be many significant developments in his home life. Don't just skip over those things, but talk about them when they seem important.

Some chapters will have "meatier" material than others. If you are lucky to have some good stuff in your chapters, you may need to come up with different examples, or draw some diagrams or make some spreadsheets to help your fellow students understand exactly what happened, and why it is significant.

All presentations should be prepared using PowerPoint, and you must give me a printed copy of your slides before you begin. Print the slides in the six per page format, but you don't need to make handouts for the whole class.

Your presentations will be videotaped, and I will post copies of the presentations on my website. After your presentation is posted, you will need to submit written comments to me about your presentation, telling me what you would do differently if you had to give the same presentation again, and what grade you believe your presentation deserves, and why. Since all of the presentations will be available on the website, you will also be free to re-watch other students' presentations.

Simulation Exercises: Much of the course will be devoted to learning how to use the production environment described in the ProSim book. In a nutshell, you will be on a team of 1 or 2 people making decisions of how much to produce, when, and how. Your goal is to meet demand for the least possible cost. Each period, you only have to make a few decisions about hiring, training, production, ordering, etc. However, making the best possible decisions is not easy. Telling me what you have decided is not nearly as important as telling me how you reached that decision. The performance of your team will be compared against standard costs, and if your efficiency is 105% of average, you will get a score of 105. If your efficiency is 80%, you will get a score of 80. This is worth 15% of your grade. Your participation in the group will also be factored in.

If you are having trouble and not doing well, come talk to me right away!

For the first four weeks, when you turn in your decisions, you must also turn in calculations (probably a printout of a spreadsheet, but it doesn't have to be) which show:

- Your forecasted demand for the month,
- predictions of the amount of X, Y, and Z you expect to produce in the week,

- and M, X', Y', and Z' you will use in the week and the rest of the month.

Homework: Homework exercises will be assigned for each chapter. Homework will be due on the next class period following the last lecture on a chapter. Homework will be graded on a 7 point scale. Homework is for you to practice applying the concepts covered in class. In the final grade calculation, 7=A, 6=B, 5=C, 4=D, 3=D-, 0=F.

COURSE GRADING: Your numerical score (as a percentage) will be computed by taking a weighted average of your score for each of the areas listed above. The course grading scale will be as follows: 100-93 (A), 92-90 (A-), 89-87 (B+), 86-83 (B), 82-80(B-), 79-77(C+), 76-73(C), 72-70 (C-), 69-67 (D+), 66-63 (D), 62-60 (D-), 59-0 (F).

COURSE SCHEDULE (Version 1.0)

Week	Dates	Topics	HW Due	Decisions Due
1	Aug 24 26	Course overview Forecasting intro ProSim structure Forec: With a trend P: ordering, materials costs		
2	31 Sept 2	F: Trend: P: report F: Trend: LR & double exp sm P: workers and training		
3	7 9	F: Trend & Seas P: Workers ProSim Quiz	P1	
4	14 16	F: Trend & Seas P: Whom to hire/fire Forecasting Review P: How much to train?	F1	2
5	21 23	Forecasting Test (LA) Quality and Breakdowns	F2	
6	28 30	Allocating final production between months		3 4
7	Oct 5 7	Spreadsheet for parts production Weekly production of Products		5 6
8	12 14	Weekly production of Products Review for ProSim Exam		7 8
9	19 21	ProSim Exam Goal presentations		9 10
10	26 28	Goal presentations (INFORMS) Goal presentations		11 12
11	Nov 2 4	Goal presentations / review NO CLASS - UNLC TRIP		13 14
12	9 11	GOAL Test NO CLASS - VETERAN'S DAY		15 16
13	16 18	Scheduling Scheduling		
14	23 25	Scheduling NO CLASS - THANKSGIVING		
15	30 Dec 2	Scheduling Scheduling		
16	7 9	Review for final FINAL 2:15 - 4:15		

Detailed Lesson plans

- 8.24 Student self-introductions, Go over syllabus, overview of Prosim
- 8.26 Workforce: availability, hiring, layoffs, firing, worker pay Worker productivity, benefits of training,
- 8.31 Review workforce, materials costs, holding costs, buying parts, effects of shortage, demand pattern, entering decisions, Understanding ProSim output, pp. 11-19.
- 9.2 Review. Cost per unit, on-time delivery objectives
- 9.7
- 9.9 Quiz over ProSim pp. 1-19 (20 min).

	Forecasting	ProSim
8.24	Basic forecasting methods pp. 6-11	Decision process, demand overview pp. 31-34

8.26	Forecasting with a trend: pp. 11-13	Machines and Labor 34-39
8.31	Forecasting with Seasonality: estimating seasonal indexes pp. 16-19	Understanding report outputs pp. 39-43
9.2	Estimating the trend pp. 19-21	Evaluating performance p.43
9.7	Seasonalized forecasts pp. 21-24	Review what we know so far
9.9		Quiz
9.14	Forecasting: Moving average, exponential smoothing, linear regression	Whom to hire? Training levels 47-49
9.16	Forecasting Review	How much to train? Wk 2 decision due
9.21	Forecasting Test	N/A

9.23 Ultimate Training tool, Quality and Breakdowns. Pp. 50-58

9.28-30 Monthly Production Requirements pp. 59-70

10.5-7 Allocating production between weeks

10.5 Parts requirements planning:

Determining weekly parts requirements (the soon-to-be-infamous “Friday/Monday rule”)

10.7 Parts production costs, extra costs of producing early or late. 92, 95-99

Scheduling weekly parts production

10.10 Wrap up parts planning

10.12 Raw materials: quantities needed, ordering policies 121-129.

10.14 Quality planning: 146-153

Maintenance planning: 161-169

Review for exam

10.19 ProSim exam

Assignments from ProSim chapter problems will be given in class.

Supplemental Problems will be available for some chapters