

**OR442 Stochastic Operations Research / MATH442 Operations Research II**  
Spring 2008

George Mason University  
Department of Systems Engineering and Operations Research

Monday and Wednesday 12:00pm-1:15pm,  
Robinson Hall, Room A111

**Instructor:** Dr. Yifan Liu

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Office Hour: Tuesday 12:00-1:00pm, and 6:00-7:00pm, or by appointment

**TA:** TBA

**Text:** Wayn. L. Winston, *Operations Research Applications and Algorithms*, Fourth Edition, 2003.

**Course Website:** All course material will be posted on **WebCT**.

**Course Summary:** A survey of probabilistic methods for solving decision problems under uncertainty. Topics covered by this class include inventory theory, Markov chains, queuing theory, forecasting, and simulation. Some review of probability theory will also be included right before the topics that use the related theory.

**Prerequisite:** STAT 346, MATH 351, or equivalent.

**Tentative Course Schedule** (subject to slight change, depending on the pace of the course)

<b>Date</b>	<b>Topic</b>	<b>Chapters</b>
1/23	Introduction and Deterministic Inventory Models (I)	15.1-15.2
1/28	Deterministic Inventory Models (II)	15.3-15.4
1/30	Deterministic Inventory Models (III)	15.5-15.6
2/4	Review of Probability (basics, normal distribution)	Handouts
2/6	Probabilistic Inventory Models (I)	16.1-16.2
2/11	Probabilistic Inventory Models (II)	16.3-16.4
2/13	Probabilistic Inventory Models (III)	16.5-16.6
2/18	Review/Exercises for Inventory Models	15, 16
2/20	Markov Chains (I)	17.1-17.2

2/25	First Midterm Exam (on Inventory Theory)	
2/27	Markov Chains (II)	17.3-17.4
3/3	Markov Chains (III)	17.5
3/5	Review of Probability (Poisson/exponential distribution)	Handouts
3/10 and 3/12	Spring break	
3/17	Queuing Theory (I)	20.1-20.2
3/19	Queuing Theory (II)	20.3
3/24	Review/Exercises for Markov Chains and Queuing Theory	17, 20.1-20.3
3/26	Queuing Theory (III)	20.4
3/31	<i>(Instructor out for conference, class cancelled)</i>	
4/2	Second Mid-term (on Markov Chains and Queuing Theory I-II)	
4/7	Queuing Theory (IV)	20.5
4/9	Queuing Theory (V)	20.6
4/14	Queuing Theory (VI)	20.7-20.8
4/16	Queuing Theory (VII)	20.9
4/21	Forecasting Models (I)	24.1-24.3
4/23	Forecasting Models (II)	24.4-24.6
4/28	Simulation (I)	21.1-21.4
4/30	Simulation (II)	21.5-21.6
5/5	Review for Queuing Theory, Forecasting and Simulation.	
5/12	<b>Final Exam</b> (on Queuing Theory III-VII and Forecasting)	

### **Grading:**

**Class Participation: 8%.** I will try to use the examples **different** from those in the textbook to illustrate the same content, and leave the textbook examples for you to read before and after class, so that you will have more examples to understand the stuff better. Therefore, class participation is mandatory, and coming to most of the lectures counts for 4%. From time to time, I will offer chances for the students to volunteer to do some in-class exercises on the board, on which 2% based. The rest 2% is awarded for other kinds of active participation, such as asking or answering good questions in class.

**Homework: 12%.** At the end of each lecture (except 2/18 and 3/24), I will assign 1 or 2 problems for homework, which will be collected, graded and returned roughly in a weekly pattern as follows:

Homework #	Problems Assigned on	Due Date	Returned Date
1	1/23, 1/28, 1/30	2/6	2/13
2	2/4, 2/6	2/13	2/20
3	2/11, 2/13	2/20	Pick-up on or after 2/21
4	2/20, 2/27	3/5	3/19
5	3/3, 3/5	3/19	3/26
6	3/17, 3/19	3/26	Pick-up on or after 3/27
7	3/26, 4/7, 4/9	4/16	4/23
8	4/14, 4/16	4/23	4/30
9	4/21, 4/23	4/30	5/5
10	4/28, 4/30	5/5	Pick-up on or after 5/6

**No late homework is accepted.** The lowest 2 scores of homework will be dropped, and each of the other 8 counts for 1.5% towards your final grade. Although the homework due date is at least 7 days from the date when the problems are assigned, you are strongly recommended to do the problems before the next class, so that you can be better prepared for the new lecture.

**Warning:** You are **not** allowed to turn in the problems into the **earlier** homework set. For example, although you are recommended to do the problems assigned on 2/4 before the lecture on 2/6, you are **not** allowed to turn in these problems on 2/6 together with the problems assigned earlier. You must hold them till 2/13. Otherwise, it will mess up the grading. **Problems submitted in the wrong set will not be credited.**

Usually, homework will be graded and returned in one week. For the homework right before the exams, they will be graded immediately on the same day of submission, and you can pick them up in my office starting from the next day, in order to help you prepare for the exams.

**First Midterm: 20%.** Monday, 2/25, class time,  
**Second Midterm: 20%.** Wednesday, 4/2, class time,  
**Final Exam: 40%.** Monday, 5/12, 10:30-1:15pm,

The final and the two midterm exams are “**semi-closed**” **book/notes**, that is, a sheet of formulae will be given, but the textbook and notes are not allowed. **No** computer allowed. Calculator is OK (and strongly recommended!). All three exams are roughly independent with each other, and non-accumulative.

Make-up exams will only be given for extreme situations, such as religious reasons, family emergency (Here “family” is only restricted to parents, spouse and children), sickness, conference or business trips, etc., and only if I am contacted **before** the exam is given and full arrangements are established. Early leave for the summer vacation does **NOT** qualify for an alternative time for the final exam.