

## **Math 113, Sections 10, 11, 13**

### **Contemporary Mathematics, Spring 2008**

Textbook: *For All Practical Purposes: Mathematical Literacy in Today's World*, by the Consortium for Mathematics and its Applications (COMAP), 7<sup>th</sup> edition, ISBN 0-7167-6901-8

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Office Hours: By appointment – best to “sign up” before or after class.

Other hours are possible, but preferred times are:

Tuesday, 1:00pm-3:pm

Wednesday, 2:30pm-4:30pm

Friday, 10:30am-11:30am

Course Description: This course is an alternative to the traditional Math 114 course for liberal arts majors. It is a three-hour course that fulfills the College of Arts and Science mathematics requirements. Some specific majors may require the Math 114, so check with your advisor.

The course consists of three modules:

Management Science – techniques to model complex activities and determine optimal solutions through analysis of various models (Chapters 1, 2, 3)

Statistics – descriptive and inferential statistics with real world applications, and probability to link descriptive and inferential (Chapters 5-8)

Social Choice and Decision Making – mathematical methods for decision making, weighted voting systems (Chapters 9, 11)

The goals are:

1. To apply the scientific method to investigate real-world phenomena
2. To construct, read and interpret graphs and other displays of data
3. To read, interpret and communicate information using appropriate mathematical language
4. To appropriately use technology to solve mathematical problems.

Supplies: Calculator - a statistical calculator is required. If you do not have one the Math Department has a limited number of TI-83 calculators to lend to students. Contact Mrs. Betty Walls, 501 Ewing, to borrow one. In class I will be using that type. If you want to buy one, there are other less expensive TI calculators that do statistics, but the procedures will not be exactly the same.

Ruler - you should invest in one, for sure.

A lot of pencils and erasers – quizzes and exams must be in pencil.

Colors – you'll probably need 4 – markers or pencils or crayons

Spiral notebook for class notes.

3-ring binder for homework.

e-mail: I sometimes communicate with the entire class using the UD e-mail. If you're in the habit of checking another e-mail regularly, but not your UD e-mail, you can set up so that your UD e-mail is forwarded to your other e-mail account.

MyCourses: MyCourses, previously know as WebCT, is an Internet resource that will be used in this course. It will have:

- Your grades on quizzes and exams and, eventually, your course grade. You can access your personal grades to keep up to date about how you're doing and to check for any record keeping errors.
- Answer keys to our exams and quizzes.
- A copy of this syllabus, and assignments and handouts which you will be sometimes need to print out.
- Announcements, posted on the course homepage.

You can access MyCourses from the UD homepage. The address is:

<https://www.udel.edu/mycourses/>

You then log in using your UDeI Net ID (your UD e-mail name) and password. Since most course information is posted on MyCourses, please check it regularly.

Grade: The number of points you accumulate during the session, using the following scale, will determine your grade.

Grade	Total Points	Percent	Grade	Total Points	Percent
A	540-600	90 – 100	C+	444-461	74 – 76
A-	522-539	87 – 89	C	420-443	70 – 73
B+	504-521	84 – 86	C-	402-419	67 - 69
B	480-503	80 – 83	D+	384-401	64 – 66
B-	462-479	77 – 79	D	360-383	60 – 63
			D-	342-359	57 – 59
			F	Below 342	Below 57

Points: You can earn points as follows.

Exams:	300 points
Final Exam:	150 points
Quizzes:	40 points
Group and individual collected work :	50 points
<u>Projects:</u>	<u>60 points</u>
Total	600 points possible

Exams: Exams will be administered from 5:30 to 6:45 on Wednesday evenings. They will be held in **120 Smith Hall**. You should be there by 5:15 with your sharpened #2 pencils, colors, calculator, ruler and your student ID.

Exam I	March 12	Chapters 1, 2 and 3
Exam II	April 16	Chapters 5, 6 and 7
Exam III	May 14	Chapters 8 and 9

The exam dates are fixed, but the exact content may vary slightly.

Exams are partly multiple choice (answers bubbled on a scan sheet), and partly free-response and short answer graded by your instructor.

**There are no make-up exams.** If you have a verified approved university excuse for missing a regularly scheduled exam, the missed exam grade will be replaced by taking the average of the other exams, including the final.

Final Exam: It will be held during finals week, May 23 – May 30. (You may indeed be required to take a final on Memorial Day.) Don't make your get away plans until you know when all your finals are scheduled.

Quizzes: There will be three 20-point quizzes administered during regular class time. The expected dates are:  
Wednesday, February 27  
Wednesday, March 26  
Wednesday, April 30

To determine your 40 points for the quizzes we'll use 2/3 of your sum total on all of them

**If you have an unexcused absence on a quiz date, you will have a zero on the quiz.** If you have a verified approved university excuse, you should contact me immediately about scheduling a make-up.

Group Work: Group activities are assigned after we cover a topic in class and then you go to group and have an opportunity to practice before doing your homework. Group problems will be worth 5 or 10 points, and are not announced ahead of time. Usually only one copy of group work is turned in, but each person must write it out! Sometimes you may start on an activity in class with your group, but be expected to complete it individually and turn it in the next class.

**An unexcused absence when there is group work will result in a zero.**

If you have an excused absence you will either get the same grade as your group or else be permitted to make it up. You should see me.

I'll drop your low 10 points.

To determine your 50 points for this work, we'll use 1/2 of your percent earned for all the group/individual work.

About Groups: Research shows that students who actively discuss mathematics have better understanding and retention than those who passively listen to lectures. I want each group member to be comfortable presenting ideas, questioning the validity of solutions and soliciting explanations.

*Please consider yourself to be responsible to and for your group. Although only one copy of a group problem is turned in, each member should write it out and participate in the solution. Try to never let a group problem be turned in unless you agree with the solution and understand it.*

Projects: The guidelines for the two projects will be discussed in class. (The second project will be done by pairs of students.)  
Projects will be due:  
Friday, March 7  
Monday, May 5

Attendance: Class attendance and participation in class and group are important for you in learning the concepts and techniques presented. So don't miss class, but if you do have to, please get the class notes (from someone in your group), read the book and try to catch up as soon as possible.  
I will pass an attendance sheet around each day.

Academic Honesty: The following statement is from the Student Guide to University Policies.  
*"All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither give nor receive unauthorized assistance. Any violation of this standard must be reported to the Office of Judicial Affairs."*

Also included in the Student Guide is a statement about cheating. The policies in detail are at:  
<http://www.udel.edu/stuguide/06-07/code.html> - honesty

#### Classroom Courtesy

1. Please make every effort to get to class on time and stay in the room for the entire class.
2. If it is necessary to leave class early please let me know beforehand.
3. Please don't talk while I'm lecturing or another student is speaking to the class.
4. If you bring a drink to class it would be good for it to have a screw top.
5. Please turn off and put away cells and other electronic gadgets before you enter the room.
6. Please try to stay awake. If you feel yourself dozing off you might try finger or foot mavage, holding your eyelid open, or getting involved with the topic at hand. Bringing caffeine to class is OK with me. But please please please do not settle in for a nap.

Thanks for your cooperation. And feel free to see me with any questions or concerns that you have.

#### Homework Assignments

Following is a list of topics and accompanying homework problems.

Many, if not most, of these topics may not be familiar to you. I suggest that you read a section or two even before coming lecture so as to get the most out of it.

***The most important thing you can do to help yourself learn the material and successful on the exams, and thus in the course, is to do all the homework, and on a timely basis.***

Read or reread the section before attempting the homework, and do so as soon after the class as possible.

Chapter	Section	Page	Assignment
<b>MANAGEMENT SCIENCE</b>			
1	Skills Check	22	1-20
	Basic Concepts	25	1-11, 17-19, 21
	Euler Circuits	27	24-29
	Eulerization and Squeezing	28	31-36, 38-41, 42AB, 43-46, 47AB, 49, 50, 53
2	Skills Check	61	1-20
	Hamiltonian Circuits	64	1-3, 6, 7a, 10-12, 17
	Counting Problems	68	22-27, 29-31
	Traveling Salesman Problems	69	33-39, 40a, 41-44, 47
	Trees and Spanning Trees	72	48-55, 61-65 odd
	Scheduling	68	68, 69, 71
3	Skills Check	108	1-20
	Scheduling	110	1, 4-9
	Using the List-Processing Algorithm	111	12-19, 24-26
	Independent Tasks and Other Issues	114	27, 29, 30, 33-37
	Bin Packing	116	43-47, 51, 57
	Coloring Problems and Conflict Resolution	118	63-71, 76, 77
<b>STATISTICS</b>			
5	Skills Check	208	
	Displaying Distributions: Histograms	210	1, 2, 4-6
	Displaying Distributions: Stemplots	211	7, 9, 10
	Describing Center: Mean and Median	213	11-13, 16
	Quartiles, the Five-Number Summary, and Boxplots	214	17, 20-23, 25, 26, 28
	Describing Spread: The Standard Deviation	216	29, 31-34, 37
		217	38, 39, 41-43, 47, 48, 50
	Normal Distributions and the 68-95-99.7 Rule	219	51-55
Chapter Review			
6	Skills Check	240	1-20
	Scatterplots	242	1-4, 7
	Regression Lines	244	10-12, 14
	Correlation	245	15-17, 21-24
	Least Squares	246	27-31 odd
	Interpreting Correlation and Regression	248	38, 39, 43
	Chapter Review	249	45-49

Chapter	Section	Page	Assignment
7	Skills Check	283	1-20
	Sampling	285	1, 2
	Bad Sampling Methods	285	3-6
	Simple Random Samples	285	7, 8, 10-13
	Cautions About Sample Surveys	287	15-17
	Experiments	287	18, 19, 21-27 odd, 28
	Thinking About Experiments	289	31-35 odd
	Inference: From Sample to Population	290	36-40
	Confidence Intervals	291	43, 45, 46, 49, 51-53
	Chapter Review	292	54-56
8	Skills Check	324	1-20
	Probability Models and Rules	326	3-5, 7, 9-11
	Discrete Probability Models	327	12, 13, 15-17
	Equally Likely Outcomes	329	19-23, 25, 27
	Continuous Probability Models	329	29-31
	The Mean and Standard Deviation of a Probability Model	330	32-34, 39, 40, 42, 43
	The Central Limit Theorem	332	45, 46, 48, 51, 52
	Chapter Review	333	53-57

## SOCIAL CHOICE AND DECISION MAKING

9	Skills Check	362	1-20
	Other Voting Systems for Three or More Candidates	364	7-9, 11, 14, 15a, 23, 24, 27, 29
	A Better Approach? Approval Voting	367	32, 33
11	Skills Check	423	1-20
	How Weighted Voting Works	424	1, 3, 4
	Shapley-Shubic Power Index	425	5-7, 9
	Banzhaf Power Index	425	11-18
	Comparing Voting Systems	426	19, 28-31

