Syllabus

Course Information	
Course title:	Mathematics in Our Society
Course number:	MAT 110b
Course discipline:	Mathematics
Course description:	An introduction to applied mathematics devoted to solving contemporary problems in the context of decision-making, finance, and data analysis. The aim is to develop logical thinking and quantitative skills with linear equations, exponential models, and statistics.
Course date:	Monday, August 31, 2009 through Friday, December 4, 2009
Location:	Olin 124
Meeting day(s):	MWF
Meeting time(s):	1:50-2:50pm
Prerequisite(s):	Not open to students who have established basic skills in math.
Professor Information	
Name:	Marian Anton
Email:	marian.anton@centre.edu
Office location:	Olin 114
Office hours:	MWF 9:10-10:10am, Tuesday 9:10-11:10am, and by open door or appointment
Phone:	(859) 238-5405
Study Sessions	
Tutor:	Cara Newcomb
Email:	cara.newcomb@centre.edu
Location:	Olin 123
Hours:	Sunday, Tuesday, Thursday 9-10pm
Textbook	
Required reading:	*Fundamentals of Algebraic Modeling*, Timmons et al, Brooks/Cole, 5th/2010, ISBN: 9780495555094
Course Goals	
Course goals:	• demonstrate proficiency with basic math tools • apply knowledge to real-world problems • develop teamwork and communication skills
Lectures	
Activities:	A typical lecture starts with a conversation about the reading assignment (students must read before class), continues with a workshop on odd numbered problems (bring your book and calculator), and ends up with a short quiz on reading. There are also a number of written assignments. A useful guide for technical writing is the following: http://ems.calumet.purdue.edu/mcss/kevinlee/mathwriting/writingman.pdf Typing is not recommended for this course except maybe for the labs. All assignments are collected at the beginning of each class (not by email) and count towards attendance.
Assessment	
Homework:	There are (top) 25 homework assignments at 3 points each consisting of selected even numbered problems. Collaborative work is allowed, but must be acknowledged (see academic honesty.) Solutions are posted on Web-CT after each homework submission. Homework check list:

- Name, section, date
- Book section(s)
- Acknowledgement
- Explain the method used
- English composition
- Math syntax
- At least 3 correct answers

Quizzes: There are (top) 25 random quizzes at 1 point each. Each index card (provided) must contain student's name and the question on the same page and the answer on the verso; the question will be given from the reading assignment. Quiz check:

- Name and question vs. answer

Lab projects: There are 7 labs at 10 points each. The labs are designed for team work outside the classroom with the class divided into seven teams. For each lab, the team must choose a lab manager who submits a written report (usually after the exam.) Final report check list:

- Name(s), section, date
- Include the lab sheet
- Explain the method used
- English composition
- Math syntax
- Numerically accurate results
- Include the presentation assessment (see presentation)

Presentation: There is one presentation worth 10 points. By rotation, each team will form a panel to present a partial draft and answer questions for 5-10 minutes. The other teams must submit their questions in advance and make an assessment of the panel in their final reports. The questions must be specific and cannot solicit final results. Teams should not collaborate outside the panel discussion! Panel check list:

- Time interval 5-10 minutes
- Collect questions in advance
- Describe the main problem
- Explain the method intended
- Use media appropriately
- Have a plan B
- Answer questions

Non panel team checklist:

- Make a draft of your lab
- Submit specific questions in advance
- Do not solicit the final results
- Assess the panel presentation

Exams: There are 3 midterm exams at 40 points each and 1 comprehensive final at 60 points. The exams will be given from the material covered by the homework and quizzes. In particular, students must review and correct missed problems using Web-CT, office hours, and study sessions. Only standard calculators are allowed in exams.

Grading Policy

Written papers: A point deduction could be for an inaccurate answer, confusing English, incorrect math syntax, wrong method, or failing to follow instructions. The grade for a final lab report will be shared by all members of the same team.

Presentation: A point deduction could be for stepping outside the time interval, not collecting questions, confusing description of the main problem, wrong method, inappropriate media, no plan B (if needed), failing to answer questions, negative assessment by the other teams. The

grade for the presentation will be shared by all members of the same team.

Distribution:

Homework (25)	75	21
Quizzes (25)	25	7
Labs (7)	70	19
Presentation	10	3
Exams (3)	120	33
Final	60	17
Total	(p) 360	(%) 100

Grading scale: 0-61U;62-69D;70-72C-;73-76C;77-79C+;80-82B-;83-86B;87-89B+;90-92A-;93-100A

Attendance Policy

Attendance: 4 absences may result in a grade reduction. For each excused absence the professor should be notified in writing a.s.a.p. Make-ups are possible only for notified excused absences.

Academic Honesty

Guidelines: Students are allowed to collaborate on homework, but their writing must be independent. When receiving help this should be acknowledged on the first page. The lab teamwork is collaborative par excellence, but no collaboration among teams is allowed outside the panel discussion. Do not solicit a final result before submission. All quizzes and exams are closed books. Cheating and plagiarizing are very serious offenses. Also, students are advised not to disseminate class materials to any third party due to licensing issues.

General Conduct

Expectations: Students should comply with the Centre College Student Handbook. They should attend every class, complete all assignments on time, and follow basic etiquette rules. These include no food, no laptops, no cells, no newspapers, no hats, no talk, no walk etc. Students should be respectful and responsible. Recommended reading: http://www.suite101.com/article.cfm/college_success/41072

Learning Skills

Try this site: http://www.dartmouth.edu/~acskills/ and this site http://www.whenwilliusemath.com/howtosucceedinmath and stay healthy!

Caveat

Special needs: Please contact Assistant Dean Mary Gulley.

Changes: This syllabus is subject to change and updates are posted on Web-CT.

Calendar 2009 (tentative)

Monday, August 31	*Models and real numbers:* ***read 1.1, 1.2*** *HW 1.2: 2-46 evens, 52, 60, 64, and 72; start How Many Pets?*
Wednesday, September 2	*Formulas and percents:* ***read 1.4, 1.6; submit 1.2*** *HW 1.4: 2-10 evens, 14, 16, 22, 28, 34, 36; 1.6: 22-32 evens, 36-52 evens*
Friday, September 4	*Rectangular coordinates:* ***read 2.1, 2.2; submit 1.4, 1.6*** *HW 2.1: 2-10 evens; 2.2: 2, 8-18 evens, 24, 28, 30; start Toto Are We Still In Kansas?*
Monday, September 7	*Slopes:* ***read 2.3; submit 2.1, 2.2*** *HW 2.3: 2-8 evens, 14-28 evens*
Wednesday, September 9	*Equations of lines:* ***read 2.4, 2.5; submit 2.3*** *HW 2.4: 4, 6, 20, 24-28 evens, 40; 2.5: 2-12 evens*
Friday, September 11	*Functions and graphs:* ***read 3.1; submit 2.4, 2.5*** *HW 3.1: 2, 6, 10-24 evens, 30; start The Population Bomb*
Monday, September 14	*Linear functions:* ***read 3.2, 3.3; submit 3.1*** *HW 3.2: 6, 10, 14, 18, 24, 30 ; 3.3: 8, 10-16 evens*
Wednesday, September 16	*Variation and quadratic functions:* ***read 3.4, 3.5A; submit 3.2, 3.3*** *HW 3.4: 16, 18, 26-38 evens; 3.5A: 2-8 evens, 24-28 evens*
Friday, September 18	*Quadratic equations:* ***read 3.5B; submit 3.4, 3.5A*** *Practice 3.5B: 14-18 evens, 22, 30*
Monday, September 21	***Lab presentations: How Many Pets? Toto, Are We Still In Kansas?*** *Review and correct missed problems*
Wednesday, September 23	***Exam 1***
Friday, September 25	*Exponential functions:* ***read 3.6; submit final lab reports 1st, 2nd*** *HW 3.6: 2-14 evens, 20, 22, 28*
Monday, September 28	*Business models****: read 4.1; submit 3.6*** *HW 4.1: 2, 4, 10, 12, 16, 20, 28, 30; start Should We Use 100% Financing?*
Wednesday, September 30	*Banking models:* ***read 4.2; submit 4.1*** *HW 4.2: 2, 10, 14, 18, 22, 26, 30*
Friday, October 2	*Consumer credit models:* ***read 4.3; submit 4.2*** *HW 4.3: 6, 12, 14, 24-30 evens*
Monday, October 5	*Purchasing models A:* ***read 4.4; submit 4.3*** *HW 4.4: 10-16 evens, 20-30 evens*
Wednesday, October 7	*Purchasing models B:* ***read 4.5; submit 4.4*** *HW 4.5: 8-14 evens, 20-26 evens, 36, 38*
Friday, October 9	*Insurance models:* ***read 4.6; submit 4.5*** *HW 4.6: 10-20 evens, 24*
Monday, October 12	*Investment models:* ***read 4.7; submit 4.6*** *HW 4.7: 2-10 evens*
Wednesday, October 14	*Income models:* ***read 4.8; submit 4.7*** *Practice 4.8: 4, 8, 12, 16, 18, 24, 26*
Monday, October 19	***Lab presentations: The Population Bomb; Should We Use 100%?*** *Review and correct missed problems*

Wednesday, October 21	***Exam 2***
Friday, October 23	*Graphic method for systems:* ***read 6.1; submit final lab reports 3rd, 4th*** *HW 6.1: 2, 4, 8-22 evens; start The Chemistry of Salt Water*
Monday, October 26	*Algebraic method for systems:* ***read 6.2; submit 6.1*** *HW 6.2A: 2-14 evens, 22-44 evens*
Wednesday, October 28	*Review and applications:* ***read 6.3; submit 6.2A*** *HW 6.2B: 46-52 evens; 6.3: 10-14 evens, 20-24 evens, 36*
Friday, October 30	*Sets:* ***read 7.1; submit 6.2B, 6.3*** *HW 7.1: 2-20 evens, 32-40 evens; start Triangulating a Probability*
Monday, November 2	*What is probability?:* ***read 7.2; submit 7.1*** *HW 7.2: 8-16 evens*
Wednesday, November 4	*Probability and odds:* ***read 7.3; submit 7.2*** *HW 7.3: 32-38 evens, 56, 58, 62-68 evens, 72*
Friday, November 6	*Tree diagrams:* ***read 7.4; submit 7.3*** *HW 7.4: 2-6 evens, 12, 14, 22-30 evens*
Monday, November 9	*Or/and problems:* ***read 7.5; submit 7.4*** *HW 7.5: 2-18 evens, 26-32 evens*
Wednesday, November 11	*Counting principles:* ***read 7.6; submit 7.5*** *Practice 7.6: 10-14 evens, 18, 22-28 evens, 32-36 evens, 42, 46, 48, 52*
Friday, November 13	***Lab presentations: The Chemistry of Salt Water; Triangulating*** *Review and correct missed problems*
Monday, November 16	***Exam 3***
Wednesday, November 18	*Introduction to statistics:* ***read 8.1; submit final lab reports 5th, 6th*** *HW 8.1: 2, 4, 12, 14, 18, 22-36; start Gentlemen, Start Your Engines!*
Friday, November 20	*Descriptive statistics:* ***read 8.2, 8.3; submit 8.1*** *HW 8.2A: 4, 6, 16 ; 8.3: 4-10 evens*
Monday, November 23	*Review and variation:* ***read 8.4; submit 8.2A, 8.3*** *HW 8.2B: 12, 22, 24; 8.4: 2-8 evens, 14, 22*
Monday, November 30	*Normal curve:* ***read 8.5; submit 8.2B, 8.4*** *HW 8.5: 2, 4, 8, 26, 28, 30-38 evens, 40, 42*
Wednesday, December 2	*Linear regression:* ***read 8.6; submit 8.5*** *Practice 8.6: 2-8 evens, 12, 14*
Friday, December 4	***Lab presentation and final report: Gentlemen, Start Your Engines!*** *Review and correct missed problems (comprehensively)*
Thursday, December 10	***Final exam (comprehensive) @1:30-4:30pm***