Math 104Q: Introductory College Algebra and Mathematical Modeling

Fall 2006

I would advise you Sir, to study algebra, if you are not already an adept in it: your head will be less muddy, and you will leave off tormenting your neighbors about paper and packthread....

Samuel Johnson

Coping with Math anxiety -- *a great article for you*

Math Links for Information and Fun -- *find out the links between math and everything*





Instructor's Resources

Student's Handouts -- *Group Projects, Handouts, Sample Exams, etc.* -- *take with you for your next Q course*

Name	Section	Office	Office Hours
Sarah Glaz **Course Coordinator** glaz@math.uconn.edux	001 T, Th 11-12:15 MSB 315	MSB 202 (860) 486	T, Th 12:15 - 1:15 and by appointment

(click on link and remove end x)	& M 2 - 3:30 MSB 307 (+ a 2-hour review class before Final Exam)	9153	**Open door Policy***
Su Liang liang@math.uconn.edux (click on link and remove end x)	002 T, Th 8 - 9:15 MSB 415 & M 8 - 9:30 YNG 327 (+ a 2 hour review class before Final Exam)	MSB 331 (860) 486 1284	M 10-11, Th 9:30-10:30 and by appointment (+ additional office hours before tests)

***Open Door Policy:** You are welcome to drop by to discuss any aspect of the course anytime on the days I am on campus --
Monday, Tuesday, and Thursday.

General Information:

Math 104Q is a course designed to serve as preparation for all the other Q courses offered at UConn. It emphasizes two components, the mastery of each is equally important for success in any course employing mathematics. The first component is made up of the collection of fundamental algebraic concepts and their manipulations. Most of this material is taught in High Schools and Community Colleges under the name Intermediate Algebra or Algebra II. Math 104Q covers this material using a college algebra approach. The second component consists of using these algebraic concepts for solving multi-step problems from other disciplines. This practice is called Mathematical Modeling, and is the part of the course that gives Math 104Q its unique interesting flavor, liveliness and usefulness beyond a usual Intermediate Algebra course. Students will work on mathematical modeling projects in small groups. Math 104Q was offered last year as an experimental course under the number Math 195Q. Math 104Q became a permanent course this year, and is intended to eventually replacement of Math 101. Math 104Q earns students 3 Q credits which count

towards graduation.

Who Should Take Math Math 104Q?

All students whose high school algebra needs reinforcement. In particular, students who did not take a course in Intermediate Algebra prior to enrollment at UConn, or had taken such a course and obtained a grade of C or lower, or had not taken a course in mathematics for a number of years, are strongly advised to take Math 104Q, before attempting to enroll in any other Q Course. It is a small investment of your time, that will earn you 3 Q credits which count towards graduation, and repay you with a successful completion of your other Q courses at UConn.

Textbook:

Intermediate Algebra, by K. Elayn Martin-Gay, 4^{th} edition
Available at UConn's bookstore in a package which includes a Student Solution Manual and supplementary CDs of selected lessons

Other Requirements:

A simple Scientific Calculator, for example TI-30Xa.

Expectations:

You are expected to attend all classes. To encourage attendance there will be occasional assignments due at the end of the class, or one-question quizzes at the beginning of the class. You are responsible for everything that happens in class. If you miss a class, you are expected to find out what happened either from me or from your classmates. You are also expected to work outside of class about 4 hours per week. Most of all, I hope that as the course progresses you will get excited about what you are learning and delight in your own, perhaps unexpected, ability to solve mathematical problems.

Homework:

Homework will be assigned after every section, collected every Tuesdays, and returned the following class. Homework assignments will consist of exercises selected from the Practice Exercises in the Syllabus table below, and projects provided as handouts in class. There will be individual

assignments and group assignments. Group assignments will be graded, individual assignments will carry exam points (this will be explained in class).
The majority of homework assignments will be done outside of class, but we will devote 30 to 50 minutes every Monday to questions related to difficulties in the homework. You are encouraged to work with other students in this class on all your homework assignments.

Calculator Policy:

No calculators are allowed during exams or quizzes. All calculations required in these instances can reasonably be done by hand. Calculators will be used for mathematical modeling group projects using real data, and other in-class and homework assignments where hand calculations may be too time consuming.

Tutoring Options:

I welcome you and encourage you to come to me with any difficulties arising in this class. If you have difficulties coming to my office hours, talk to me, and we will find another time when we can meet. If you feel you need additional help, there are a variety of other tutoring options:

The UConn Q Center: Free drop-in tutoring available at the Q Center, in the CUE Building, Sunday - Thursday, 2 - 10.

Private Tutoring: A list of private tutors maintained by the Q Center.

Prentice Hall Tutoring Center: Free text-specific online and phone tutoring Sunday - Thursday. Access Code in your textbook package.

Online Helpful Websites: Websites providing help in the form of: explanations, examples, sample exams, and online answers to questions:

Ask Dr. Math: At the Math Forum @Drexel University.

Math for morons like us: From the ThinkQuest Library.

Exams Schedule:

There will be three in-semester, in-class exams and a Final Exam. None is strictly cumulative, but there will be overlap of material between the exams.
NO MAKE-UP EXAMS unless there is a very serious emergency for which you provide proof.

	Section 001	Section 002
Exam 1	**Thursday, September 21, 11 - 12:15, MSB 315**	**Thursday, September 21, 8 - 9:15, MSB 419**
Exam 2	**Thursday, October 19, 11 - 12:15, MSB 315**	**Thursday, October 19, 8 - 9:15, MSB 419**
Exam 3	**Thursday, November 16, 11 - 12:15, MSB 315**	**Thursday, November 16, 8 - 9:15, MSB 419**
Final Exam	**Wednesday, December 13, 10:30 - 12:30, ARJ 139**	**Wednesday, December 13, 10:30 - 12:30, ARJ 317**

For help with location of the Final Exam Building click on The Campus Map.

Grading Policy:

Homework, Quizzes, and Group Projects: about 12%. Each Exam (including the Final Exam): about 22%.

Syllabus:

Expect the course to cover every week, 2 to 4 sections from the textbook, and 1 or 2 Group Projects selected from the table below. The suggested Practice Exercises in the table below are designed to provide you with plenty of practice for a thorough understanding of the concepts taught in class. The actual homework assignments may vary according to progress in class. If you miss a class, and cannot find out which of the Practice Exercises were assigned as homework, do all the Practice Exercises suggested in the table for the missed sections. In addition, a number of fun and interesting projects highlighting applications of the material will be handed out in class every week-- usually on Mondays. Those will be selected from the activities labeled Group Projects in the table below. You will work on them together in small groups during class time, and complete them as out-of-classroom homework projects. Instructors of Math 104Q may find the Group Projects by clicking on the Instructor's Resources icon at the top of the page. If you forgot the password send an e-mail to Sarah Glaz.

Review-Class (Optional Attendence), and Office Hours in The Final Exam Week:

Section 001	Section 002
Review Class: Tuesday, Dec.12, 12:30 - 2:30, MSB 315	**Review Class: Monday, Dec.11, 12:30 - 2:30, MSB 415**
Office Hours: Mon. 12:30 - 2	**Office Hours: Tues. 12:30 - 2**
Tues. after review class as needed	**Wed. 9:30 to exam time**
Wed. 9:30 to exam time	

Section	Topic	Practice Exercises
Introduction		Math-autobio
Chapter 1		
1.2	Algebraic expressions and sets of numbers	page 15-17: odd 1-9, odd 15-90
1.3	Operations with real numbers	page 27-30: odd 1-84
Review	Fractions, percentages, unit conversion (Chapter 1 handouts)	Conversion Rectangle Trick homework handout
1.4	Properties of real numbers	page 40-42: odd 1-97
Group Project	Are irrationals rational?	
Group Project	Calculate your BMI	
Group Project	Analyze newspaper circulation	
Chapter 2		
2.1	Linear equations in one variable	page 60-61: odd 1-20, odd 23-30, 35
2.2	Introduction to problem solving	page 68-73: odd 1-12
2.3	Formulas and problem solving	page 79-81: 1-5, odd 49-54

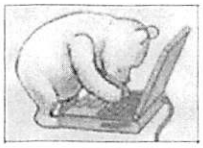
2.4	Linear Inequalities and problem solving	page 92-94: odd 1-16, odd 17-32, odd 57-74
2.6	Absolute value equations	page 108-109: odd 1-72
Group Project	Algebraic poetry -- Lilavati's swarm	
Group Project	Algebraic poetry -- The rose-red city	
Group Project	Calculate your income	
Exam 1		
Chapter 3		
3.1	Graphing equations (include material from 3.3)	page 140-141: odd 1-10, odd 17-46
3.2	Introduction to functions	page 151-156: odd 1-12, odd 23-36, 55-62
3.4	The slope of a line	page 177-180: 1,5,25,27,29,37,39,odd 45-70, 82-87
3.5	Equations of lines	page 189-192: 1,3,7,9,13,15,21,25,27,40-52
Group Project	Hurricane season (and Tracking Chart)	
Group Project	Three swimmers	
Group Project	Cigarette ads	
Group Project	Life expectancy	
Chapter 4		
4.1	Linear equations in two variables	page 225-227: odd 1-14, odd 35-48
Group Project	Which Honda should you buy?	
Group Project	Photos of all sizes	
Exam 2		

Chapter 5		
5.1	Exponents	page 282-284: odd 1- 62
5.2	More exponents	page 289-291: odd 1-56
5.3	Polynomials and polynomial functions	page 300-303: 17-24, 29,31,37,39,43,71
5.4	Multiplying polynomials	page 311-313: 1,5,7,19,25,27,35,43
5.5	The greatest common factor	page 318-320: odd 1-16
5.6	Factoring trinomials (use quadratic formula for roots from 8.2)	page 327-329: odd 17 - 89
5.7	Factoring special products	page 334-335: odd 1-16
5.8 (partial)	Solving quadratic equations (via quadratic formula and roots)	page 350-353: 1,3,5,9,17,81
Group Project	The largest box	A Special Largest Box (Spring 2006)
Group Project	Factoring trinomials completely	
Group Project	Free falling from bridges	
Chapter 6		
6.1	Multiplying and dividing rational expressions	page 372-375: 1,3,5,7, odd 19-38, odd 41-50
6.2	Adding and subtracting rational expressions	page 381-383: 1,3, odd 11-24, odd 27-34
Group Project	Calculate your lottery winning	
Group Project	Modeling electricity	

Exam 3

Chapter 7		
7.1	Radicals and radical functions	page 453-454: odd 1-54
7.2	Rational exponents	page 462-463: odd 1-62
7.6 (partial)	Radical equations	page 492-492: odd 1-58
Group Project	Skid marks	
Group Project	The period of a pendulum	
Chapter 9		
9.3	Exponential functions	page 611: odd 1-36
9.4	Logarithmic functions	page 620: odd 1-70
9.5	Properties of logarithms	page 626: odd 1-18
9.7 (partial)	Exponential and logarithmic equations	page 640: odd 1-46
Group Project	The black bear population	
Group Project	Puzzled by Logs?	
Optional Topics		
5.1	Scientific notation	page 282-284: odd 63-94
5.2	More scientific notation	page 289-291: odd 57-77
Group Project	Very large and very small numbers	
4.2	Linear Equations in Three variables	page 233-234: odd 1-32
Group Project	Tacos anyone?	
9.6	Logarithms and Change of Base	page 633: odd 17-68
Group Project	How long it takes to double your money?	

Final Exam



This page is maintained by Sarah Glaz
Last modified: Fall 2006