

Syllabus for Math 4160 – Senior Seminar

Spring 2009

Course Information

Meeting Time/Location: 1:00 – 1:50 M in RBN 4019

Instructor Information:

Dr. Casey Mann

RBN 4005

cmann@uttyler.edu (preferred method of contact outside of class/office hours)

(903) 566-7449

Office Hours: 8:00 – 8:50, 10:00 – 10:50 MWF or by appointment.

Course Description: This “capstone” course is designed to evaluate what you have learned as a math major at UT Tyler and to give you an opportunity to explore additional mathematical ideas from start to finish outside the classroom with a faculty mentor. After selecting a research topic, you will research that topic to prepare a paper using Latex and give an oral presentation at the end of the semester.

Course Prerequisites: You must be within 10 hours of completing all mathematics courses needed for graduation and satisfy *one* of the following

- Grade of C or better in Math 3336 (Abstract Algebra I)
- Grade of C or better in Math 3345 (Introduction to Analysis)
- Grade of C or better in Math 3365 (Geometric Systems)

Student Learning Outcomes: Upon completion of this course, students should be able to do the following:

- Construct a well-written mathematical research paper (critical thinking & communication)
- Typeset a mathematical document using LaTeX (critical thinking)
- Prepare a professional presentation using Latex or PowerPoint (critical thinking)
- Make an oral presentation (communication)

Semester Grades: Your grade will be based on the following categories:

- Class participation & attendance (20%). It is expected that you will be present for all weekly meetings and that you will participate in all class related activities.
- Meeting deadlines (10%)
- Attending two mathematical presentations (includes math club meetings) (10%)
- Grade recommended by the faculty mentor based on your research paper and your overall work for the semester (40%)
- Oral presentation at the end of the semester. This grade will be determined by the recommendation of faculty who are present for the presentation (20%)

Based on the percentages above, you will earn an overall class percentage which will be the basis for your overall class letter grade. The grade scale for assigning letter grades will be as follows:

90% - 100%	A
80% to less than 90%	B
70% to less than 80%	C
60% to less than 70%	D
Less than 60%	F

Attendance and participation are expected and required. 40% of the overall grade comes from attendance, participation (which includes assignments given in class), meeting deadlines, and attendance of professional presentations. Every student starts with 100% of the possible points for each category. The first infraction against this policy results in losing half of the credit for the corresponding category. For example, one unexcused absence will lower your credit for the attendance/participation category from 20% to 10% (effectively reducing your maximum possible course percentage from 100% to 90%). Points can also be lost when assigned work is not completed satisfactorily.

Deadlines

January 15 – Email Dr. Mann your preference ranking for topics.

January 21 – Have initial meeting with faculty advisor.

January 26 – Submit five printed sources for your research project (at most two of which can be online resources).

February 9 – Submit an outline of the research project.

March 2 – Submit a first draft of the research paper along with a 1-page completion plan.

April 6 – Submit a second draft of the research paper along with a 1-page completion plan.

April 13 – Submit a printed draft of slides for the oral presentation.

May 4 – Submit the final version of the research paper.

Schedule of Presentations

Week	Dates	Activity	Leading faculty
1	Jan. 12	How to do a literature search	Mann
3	Jan. 26	How to use LaTeX, Last day to withdraw without penalty	Mann
4	Feb. 2	How to use LaTeX	Mann
5	Feb. 9	Math subject GRE Prep	TBA
6	Feb. 16	Math subject GRE Prep	TBA
7	Feb. 23	Take Math Subject GRE	
8	March 2	How to Give a Great Presentation	McLoud
9	March 16	Faculty Presentation	Koslover
10	March 23	Discussion about giving presentations	Mann
11	March 30	Discussion about writing research papers	Mann
12	April 6	Careers in Mathematics	TBA
13	April 13	Faculty Presentation	TBA
14	April 20	Student Presentations	
14	April 22	Student Presentations	
14	April 24	Student Presentations	
15	April 27	Student Presentations	
15	April 29	Student Presentations	

University Policies

Students Rights and Responsibilities

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: <http://www.uttyler.edu/wellness/StudentRightsandResponsibilities.html>

Grade Replacement/Forgiveness

If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by the census date (January 26, 2009). Failure to do so will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates will receive grade forgiveness (grade replacement) for only three course repeats; graduates, for two course repeats during his/her career at UT Tyler.

State-Mandated Course Drop Policy

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (January 26, 2009).

Exceptions to the 6-drop rule include, but are not limited to, the following: totally withdrawing from the university; being administratively dropped from a course; dropping a course for a personal emergency; dropping a course for documented change of work schedule; or dropping a course for active duty service with the U.S. armed forces or Texas National Guard.

Petitions for exemptions must be submitted to the Registrar's Office and must be accompanied by documentation of the extenuating circumstance. Please contact the Registrar's Office if you have any questions.

Disability Services

In accordance with federal law, a student requesting accommodation must provide documentation of his/her disability to the Disability Support Services counselor. If you have a disability, including a learning disability, for which you request an accommodation, please contact Ida MacDonald in the Disability Support Services office in UC 282, or call (903) 566-7079.

Student Absence due to Religious Observance

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement:

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

Math Subject GRE Information

Math Subject GRE: In order to evaluate your performance in the UT Tyler Mathematics program, you will take the Math Subject GRE. This test will not be given officially, so you will not have a Math Subject GRE score for attending graduate school nor will you have to pay the fee associated with an official test. This test is to assess how much you have learned here at UT Tyler. There will be review session. The following information was taken from a website about the Math Subject GRE:

- The test consists of approximately 66 multiple-choice questions drawn from courses commonly offered at the undergraduate level.
- Approximately 50 percent of the questions involve calculus and its applications - subject matter that can be assumed to be common to the backgrounds of almost all mathematics majors.
- About 25 percent of the questions in the test are in elementary algebra, linear algebra, abstract algebra, and number theory. The remaining questions deal with other areas of mathematics currently studied by undergraduates in many institutions.

The following content descriptions may assist students in preparing for the test. The percents given are estimates; actual percents will vary somewhat from one edition of the test to another.

Calculus - 50%: Material learned in the usual sequence of elementary calculus courses - differential and integral calculus of one and of several variables - includes calculus-based applications and connections with coordinate geometry, trigonometry, differential equations, and other branches of mathematics

Algebra - 25%

- Elementary algebra: basic algebraic techniques and manipulations acquired in high school and used throughout mathematics
- Linear algebra: matrix algebra, systems of linear equations, vector spaces, linear transformations, characteristic polynomials, and eigenvalues and eigenvectors
- Abstract algebra and number theory: elementary topics from group theory; theory of rings and modules, field theory, and number theory

Additional Topics - 25%

- Introductory real analysis: sequences and series of numbers and functions, continuity, differentiability and integrability, and elementary topology of \mathbb{R} and \mathbb{R}^n
- Discrete mathematics: logic, set theory, combinatorics, graph theory, and algorithms
- Other topics: general topology, geometry, complex variables, probability and statistics, and numerical analysis

The above descriptions of topics covered in the test **should not be considered exhaustive**; it is necessary to understand many other related concepts. Prospective test takers should be aware that questions requiring no more than a good precalculus background may be quite challenging; some of these questions turn out to be among the most difficult questions on the test. In general, the questions are intended not only to test recall of information but also to assess test takers' understanding of fundamental concepts and the ability to apply those concepts in various situations.