Math 2784/2794W

Instructor:	Dr. Stephen F. Miller
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Course Homepage:	www.math.uconn.edu/~smiller

1. Brief overview

This course will partially satisfy the W criteria for math majors. You are required to prepare a paper of at least 7 to 8 pages of revised and edited work on a mathematical topic this semester, written in accordance with common conventions in mathematics. (Taking the course twice will satisfy the 15-page requirement for a W credit. Under no circumstances will a student be allowed to write two papers in one semester to reach the 15-page minimum for a W credit.) Course handouts are available to provide some sample math papers for you to examine and some advice on mathematical writing. Read the sample papers and model your format on those samples if you are unsure how to structure your paper.

2. What is a W course?

According to the UConn regulations, W courses should:

(1) Require that students write a minimum of fifteen pages that have been revised for conceptual clarity and development of ideas, edited for expression, and proofread for grammatical and mechanical correctness;
(2) Address writing in process, require revision, and provide substantial supervision of student writing. (The structure of revision and supervision may vary, including in-class writing workshops, individual consultation, substantial formative commentary on drafts, and so on.);
(3) Have an enrollment cap of nineteen students per section;
(4) Make explicit the relation between writing and learning in the course;
(5) Articulate the structure of supervision of student writing;
(6) Explain the place and function of revision in the course;
(7) Detail how the page requirement will be met;
(8) **F Clause:** Require that students must pass the writing component in order to pass the course.

3. Course meetings

Class meetings will be in MSB 319 on Mondays 5:30-6:30 pm. There will be talks scheduled once a week for most weeks of the semester (usually on Wednesdays 5:30-6:20 pm). You are required to attend at least 7 of these talks, and the paper you write will be based on one of the talks you hear. Even if you select a topic early in the semester, you still are required to fulfill the attendance obligations, which are checked by your filling out and submitting the two-question comment sheet after the talk. Comment sheets should be submitted in the instructor's mailbox by the next Monday morning at 10 am after the talk.

In the later part of the semester when you are writing your paper, we may not hold class. Instead we will have individual conferences to discuss your topic, outline and/or rough drafts. There will be sign-up sheets posted on the instructor's office door (MSB 402) to set up an individual meeting with each student later in the semester. You should plan to have an individual meeting with the instructor before the rough draft is due.

4. Grading

Your grade will be determined as follows:

Comment sheets for 7 Math Club talks	10%
Weekly assignments	10%
Completion of outline	5%
Completion of rough draft	5%
7-8 page research paper	70%

The comment sheets are also designed to give you practice writing, although in a more informal style. They do not need to be revised or perfected, and your grade on these is mostly for completion of the assignment at an acceptable level. We will also have small weekly assignments on writing in the first part of the semester. These will also be graded for completion at an acceptable level. Your grade for the outline and rough draft are also based on completion at an acceptable level and attending at least one individual meeting with the instructor. By acceptable, I mean that it does not have to be perfect but it should not be something clearly put together at the last minute with no thought or little effort. A grading rubric for the paper will be made available later in the semester.

Late Policy: Any work turned in late will result in a half grade penalty on the grade of that particular work for each day that it is turned in late.

5. Picking a topic

How are you going to pick the topic for your paper? The titles and abstracts of the talks can be found at `http://www.math.uconn.edu/mathclub/`, although not all may be available right away. The abstracts (and perhaps to some extent the title) will give an indication of what the topic is about. At each talk, references to the literature will be made available for further reading about the themes discussed. *Keep these reference sheets together to help you select your paper topic.* After the talk you can search for more information on the topic if you found it interesting, through both the reference sheet for the talk and by a web search. There are a lot of good articles in back issues of the *American Mathematical Monthly*, for instance, which can be found on the website `http://www.maa.org/pubs/monthly.html`.

Inform the course instructor (by email or in person) once you have selected your paper topic. You are encouraged to meet with the instructor to discuss possible topics if you are not sure what to choose. Try to get some substantial background reading done soon after selecting the topic and think roughly about how your paper might be structured. If you find the mathematical techniques needed in the topic you picked to be far above your abilities, then you have chosen the wrong topic! Find a different topic for your paper.

Deadlines for submitting an outline, first draft, and final draft of your paper are 4 pm on the following dates:

(1) Feb. 28th: Pick a topic
(2) March 14: Outline of your paper
(3) March 28th: Submit first draft of paper with a cover letter
(4) April 25th: Submit final draft with a cover letter

The rough draft and final draft will not be accepted without a cover letter. On the course website, you will find an outline of what the cover letter should address.

6. Content of the paper

The most basic thing to remember is that your paper is about *mathematics*. It must have mathematical content at the college level. A paper with no serious mathematical content is not acceptable. For instance, an essay on the history of the Newton–Leibniz priority dispute over calculus would not be primarily a paper on mathematics and is not going to be accepted. Some historical remarks in your paper can be useful, but they're not the main point.

It should be evident in the outline you submit what kind of mathematics will be used or developed in the paper, so the instructor can judge that you're going in the right direction in terms of mathematical content.

A good paper will have the following features:

- An introduction that gives good motivation to the topic.
- Clearly written definitions of relevant terms (which may also be described in less formal language).
- Careful mathematical reasoning that takes the reader from the definitions to some nontrivial mathematical results. This usually is placed in the format of theorems and proofs.
- Examples that illustrate the basic mathematical ideas, including some possible points of confusion. (For instance, $|x|$ is a good example showing a continuous function need not be differentiable.)
- Show a clear mastery of the material.

In short: introduce new ideas with motivation, state results, prove them, and illustrate what they mean by well-chosen examples.

Your paper should *not* contain the following:

- A laundry list of examples, definitions, and theorems with no clear train of thought connecting them or moving in the direction of some goal.
- Two or three equations and otherwise no actual mathematical content. (For instance, a paper on baseball statistics that has only a formula for the standard deviation or a paper on shooting pool that only mentions the angle of incidence equals the angle of reflection. That's not even college-level math.)
- A persistent vagueness about the concepts being discussed. (It suggests the writer doesn't really have a grasp of the material.)
- A nonstandard tone (autobiographical, poetic, whimsical[1]).

[1]Concerning the use of jokes, follow the advice of Knuth, Larrabee and Roberts: "Humor is best used in technical writing when readers can understand the point only when they also understand a technical point that is being made."

- Errors in mathematics, history, or grammar. (Proofread, and don't count on the spellchecker to find all the mistakes on its own. As you now, some errors are still words.[2])

The paper you write should not simply be a repetition of what you heard in a talk. You are expected to do some outside reading and present some of the basic ideas from the talk supplemented by your own expository contribution to show that you have learned something (perhaps some additional examples or a proof which was stated but not explained in the talk, or an alternate proof of a theorem from the talk).

7. Writing the paper

You may use any word-processing system that can handle mathematical expressions. While not required, math majors considering further study of mathematics after college or honors students who will write a thesis in mathematics are strongly encouraged to use the LaTeX typesetting system for their paper. LaTeX is available in the math department (accounts can be provided in the department for students in this course) and this is the system which virtually all mathematicians use to write math papers. This course can provide you with some initial practice with LaTeX before you have to use it in a senior thesis or later work. A LaTeX template for a paper and some basic instructions about it are available on the course website. We will spend some class time learning LaTeX.

Keep a realistic schedule for the preparation of your paper. It might happen, if you don't pick your topic well, that you find yourself wishing to write about a different topic late in the semester. Contact the instructor immediately if you want to switch topics, so you can discuss the situation and see what your options are.

Most importantly, good writing means lots and lots of rewriting. Proofread your work not only to correct small mistakes but to check that the organization of the material flows well. Could some ideas in the paper be explained more clearly or more concisely? Does the introduction give a proper sense of what the topic is going to be about, or does it sound artificial? Think of the first draft you submit not as the first version of the paper where you have put all your thoughts down in writing, but as the first version of the paper which you are comfortable letting anyone else see.

8. University Writing Center

All UConn students are invited to visit the University Writing Center for individualized tutorials. The Writing Center staff includes talented and welcoming graduate and undergraduate students from across the humanities, social sciences, and sciences. They work with writers at any stage of the writing process, from exploring ideas to polishing final drafts. Their first priority is guiding each student's revisions, so they frequently provide a sounding board for a writer's ideas, arguments, analytical moves, and uses of evidence. They can also work with you on sentence-level concerns, but please note that they will not proofread for you; instead, they will help you become a better editor of your own work. You should come with a copy of the assignment you are working on, a current draft (or notes if you are not yet at the draft stage), and ideas about what you want out of a session. Tutorials run 45

[2]This illustrates the previous footnote, if you were reading carefully. These footnotes, along with a portion of the syllabus, are courtesy of Keith Conrad.

minutes and are free. You can drop in or make an appointment. For hours, locations, and more information, please go to writingcenter.uconn.edu.

9. Academic Integrity

In this course we aim to conduct ourselves as a community of scholars, recognizing that academic study is both an intellectual and ethical enterprise. You are encouraged to build on the ideas and texts of others; that is a vital part of academic life. You are also obligated to document every occasion when you use anothers ideas, language, or syntax. You are encouraged to study together, discuss readings outside of class, share your drafts during peer review and outside of class, and go to the Writing Center with your drafts. In this course, those activities are well within the bounds of academic honesty. However, when you use anothers ideas or language–whether through direct quotation, summary, or paraphrase–you must formally acknowledge that debt by signaling it with a standard form of academic citation. Even one occasion of academic dishonesty, large or small, on any assignment, large or small, will result in failure for the entire course and referral to Student Judicial Affairs. For University policies on academic honesty please see UConns Responsibilities of Community Life: The Student Code: http://www.dosa.uconn.edu/student_code.html. Please note that ignorance of prevailing academic conventions or of UConns policies never excuses a violation. You are encouraged to come see me if you have questions about when and how to cite; you would also be wise to consult a writing handbook.

10. Students With Disabilities

Students who think that they may need accommodations because of a disability are encouraged to meet with me privately early in the semester. Students should also contact the Center for Students with Disabilities as soon as possible to verify their eligibility for reasonable accommodations. For more information, please go to http://www.csd.uconn.edu/.