

## Program cover Document – MAT 275: Sophomore Seminar

### I. Basic Course Information

MAT 275: Sophomore Seminar meets for one 80-minute period each week and counts as a half-unit course. The Sophomore Seminar will (i) introduce students to special advanced special topics in mathematics and statistics through problem-based group activities; (ii) have majors explore various career opportunities in mathematics and statistics while providing structured mentorship in navigating aspects of the discipline; and (iii) introduce students to important technological tools used in their future academic study.

This course is a graduation requirement for Mathematics majors in the Mathematics, Applied Mathematics, and Statistics specializations. It is a course aimed primarily at sophomore mathematics majors and it is expected that most students will take the course in the spring of their Sophomore year. The course will be a regular, graded A-F course.

*Course Prerequisites:* Students must be mathematics majors. Students should be in their second year of college or have sophomore standing. The course MAT 200 is a prerequisite. MAT 205 must have already been passed or be taken as a corequisite.

*Course Description (for Bulletin):* A seminar course designed to help sophomore mathematics and statistics majors develop professionally. Students will work through enriching curriculum modules and challenging stratified problems that may involve discipline specific technological tools. Students will discuss advanced disciplinary texts, career opportunities, internships, and questions of habits of mind and professionalization in mathematics and statistics (with examples including the graduate school application process, potential career progressions, post graduate level work, and issues of diversity and representation inequity in mathematics).

### II. Learning Goals

The sophomore seminar has the following learning goals:

- A. Content goals: Students will build confidence working on a variety of problems and develop maturity in analytical thought while gaining experience disseminating and presenting on technical mathematical and statistical topics. Students will develop basic approaches to formulating and actively pursuing mathematical and statistical questions. Students will become better informed about opportunities for undergraduate reading and research, industrial internships, and graduate employment/education in mathematics and statistics. Students will learn to develop habits of mind for mathematics and statistics as a scholarly and/or industrial discipline. Students will gain experience working with technological tools and mathematical/statistical software.
- B. Performance goals: At the completion of the course, students will have completed several problem-based modules in advanced topics in mathematics and statistics. Example topics from previous years have included: algorithms in statistical learning, the algebraic

combinatorics of tilings, Cauchy sequences and complete norms, and chaos and the logistic difference equation. Students will be exposed to typesetting in LaTeX and appropriate disciplinary journal indices. Students will read excerpts from scholarly material such as a research and expository papers, book chapters, and similar material. Students will gain experience presenting in groups.

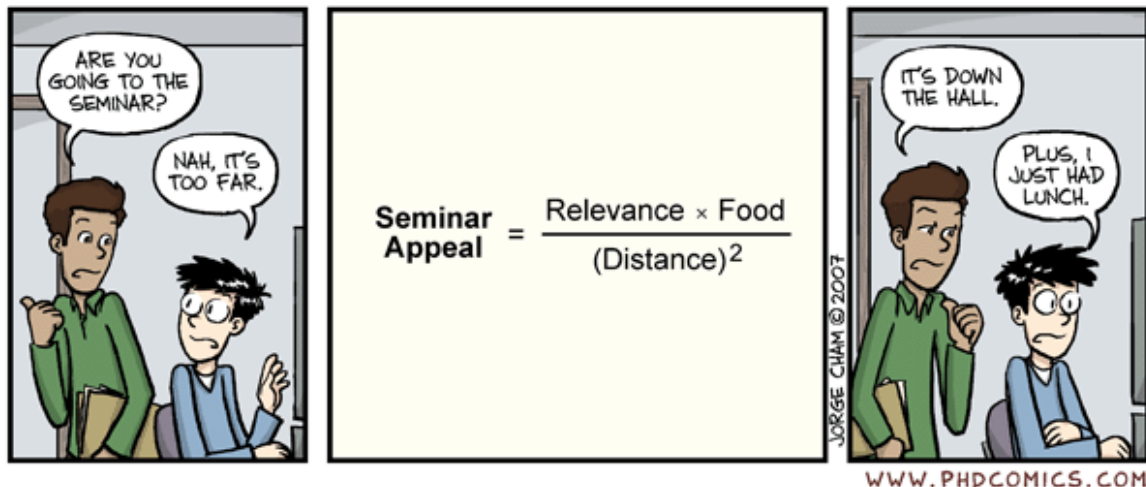
### **III. Student assessment**

- A. Assessment plan: Students will receive regular feedback about their in-class work, participation, and assignments. A syllabus will clearly describe the schedule for these assessment tools and how they will be used to calculate grades.
- B. Rationale: Through the use of regular feedback on course assessments, students will be able to see and correct their misunderstandings and improve their performance.
- C. Methods and criteria: Assignments and class participation must be completed to the extent and level designated by the instructor in a distributed grading policy.

### **IV. Learning activities**

- A. Summary of learning activities: Learning activities may consist of a combination of seminar discussions, problem-based group work, student presentations, and computer demonstrations. The specific choice will depend upon the individual instructor. Outside of class, students are expected to do individual or group work to achieve the learning goals.
- B. Calendar or outline: A guide to the organization of the course, a schedule of assessment tools, and a plan for the coverage of topics should be provided to the students. All student work responsibilities should be spaced at appropriate intervals throughout the semester.
- C. Rationale: By giving students a multitude of ways to learn about problem-solving, their discipline, and their chosen major, they will have an excellent opportunity to prepare for their remaining years at TCNJ and their transition to graduate school, industry, or public sector employment. A regular spacing of assessment tools insures that students receive continual regular feedback on their work.

# Course Syllabus

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<http://www.phdcomics.com/comics.php?f=942>

MAT 270 - Seminar in Mathematics

Spring 2019

Section 01

Monday and Thursday 3:30pm - 4:50pm -- Forcina Hall 222

(Most weeks we will just meet Thursday)

**Instructor:** Steffen Marcus

**Office:** SCP 208

**Email:** marcuss@tcnj.edu

**Office Hours:**

Monday, 1:30pm - 3:30pm

Thursday, 2:30pm - 3:30pm

**Course Description:**

MAT 270/Seminar in Mathematics

0.5 course unit

This course is a seminar designed to expose students to selected special topics in mathematics and statistics, as determined by the instructor.

**Website:** All course information, announcements, and grades will be posted on this Canvas portal website. It also contains information that may help you succeed in this course. I'll assume you are keeping up to date with its contents.

**Course Materials and Text:** Course materials will be distributed in class by the instructor.

**Course Purpose and Learning Goals:** The primary goal of this seminar is to provide you with a unified collection of enriching and mentored experiences designed to help build a culture of scholarly and professional growth. My hope is that through our weekly discussions and group-work based explorations of selected topics, you will make some headway towards a variety of learning goals, including the following:

- develop additional maturity in analytical thought and expression;
- gain experience problem solving in groups;
- gain experience disseminating technical mathematical topics to your community, both orally and through technical writing;
- develop basic approaches to formulating and actively pursuing mathematical and statistical research questions,
- gain confidence working on hard problems without immediate direction;
- be exposed to appropriate technological tools and software used in the discipline;
- become better oriented to opportunities for undergraduate research, industrial internships, and graduate employment/education in mathematics and statistics;
- become better acquainted with the culture of mathematics and statistics as a research and/or industrial discipline.

**Course Requirements:** The course will involve a combination of seminar discussions, group work, and in-class activities. Graded components include class attendance, in-class projects, in-class participation, and an annotated bibliography typeset in LaTeX. I will be also assigning reading from distributed texts and further recommended problems for you to think about. Some topics will involve assigned reading distributed the week before class, and must be read before the assigned section meeting.

**Evaluation:**

- 50% attendance and participation,
- 40% in-class work and assignments,
- 10% annotated bibliography.

I reserve the right to change the grading scheme as I see fit. Any other grading scheme I use will only be beneficial to your grade as compared to the above standard.

**Attendance:** You are expected to attend all section meetings. In the case of an emergency, you will always be personally responsible for the material presented in a class you may have missed. Please be in touch with me immediately or as soon as possible regarding any extenuating circumstances you might have.

Please also refer to the college's policies regarding [absence and attendance](http://policies.tcnj.edu/policies/digest.php?docId=9134) (<http://policies.tcnj.edu/policies/digest.php?docId=9134>).

This syllabus is intended to give the student guidance in what may be covered during the term and will be followed as closely as possible. However, I reserve the right to modify, supplement and make changes as the course needs arise.

Finally, I'll refer you to the college's policies on the [americans with disabilities act](http://policies.tcnj.edu/policies/digest.php?docId=9206) (<http://policies.tcnj.edu/policies/digest.php?docId=9206>).




















## Course Summary:

**Date**

**Details**

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**Date****Details**

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-  [Annotated Bibliography](https://tcnj.instructure.com/courses/1603178/assignments/10436763)  
(<https://tcnj.instructure.com/courses/1603178/assignments/10436763>)
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-  [Attendance](https://tcnj.instructure.com/courses/1603178/assignments/10436305) (<https://tcnj.instructure.com/courses/1603178/assignments/10436305>)
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-  [Module 1 Participation](https://tcnj.instructure.com/courses/1603178/assignments/10436671)  
(<https://tcnj.instructure.com/courses/1603178/assignments/10436671>)
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-  [Module 1 Work/Response](https://tcnj.instructure.com/courses/1603178/assignments/10436706)  
(<https://tcnj.instructure.com/courses/1603178/assignments/10436706>)
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-  [Module 2 Participation](https://tcnj.instructure.com/courses/1603178/assignments/10436684)  
(<https://tcnj.instructure.com/courses/1603178/assignments/10436684>)
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-  [Module 2 Work/Response](https://tcnj.instructure.com/courses/1603178/assignments/10436707)  
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-  [Module 3 Participation](https://tcnj.instructure.com/courses/1603178/assignments/10436686)  
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-  [Module 3 Work/Response](https://tcnj.instructure.com/courses/1603178/assignments/10436716)  
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-  [Module 4 Participation](https://tcnj.instructure.com/courses/1603178/assignments/10436687)  
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-  [Module 4 Work/Response](https://tcnj.instructure.com/courses/1603178/assignments/10436715)  
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-  [Module 5 Participation](https://tcnj.instructure.com/courses/1603178/assignments/10436685)  
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-  [Module 5 Work/Response](https://tcnj.instructure.com/courses/1603178/assignments/10436714)  
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-  [Module 6 Participation](https://tcnj.instructure.com/courses/1603178/assignments/10436693)  
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-  [Module 6 Work/Response](https://tcnj.instructure.com/courses/1603178/assignments/10436712)  
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-  [Module 7 Participation](https://tcnj.instructure.com/courses/1603178/assignments/10436692)  
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-  [Module 7 Work/Response](https://tcnj.instructure.com/courses/1603178/assignments/10436711)  
(<https://tcnj.instructure.com/courses/1603178/assignments/10436711>)
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-  [Module 8 Participation](https://tcnj.instructure.com/courses/1603178/assignments/10436695)  
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-  [Module 8 Work/Response](https://tcnj.instructure.com/courses/1603178/assignments/10436709)  
(<https://tcnj.instructure.com/courses/1603178/assignments/10436709>)
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-  [Roll Call Attendance](https://tcnj.instructure.com/courses/1603178/assignments/10454677)  
(<https://tcnj.instructure.com/courses/1603178/assignments/10454677>)
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