MAT 380/381/480: Mathematics Seminars I, II, III (Spring 2019)

Instructor: Byung-Jay Kahng
Office: 1036 Science Hall
Office Hours: WF 9:00 – 11:00, Th 1:00 – 3:00, also by appointment
E-mail: kahngb@canisius.edu (888-2493)

COURSE ANNOUNCEMENT

CLASSES: W 2:10 – 4:10, at SH 1004.

ATTENDANCE: For the seminars to be successful, full attendance is crucial. It has been a longstanding policy that for the seminars, 100% ATTENDANCE IS REQUIRED. Exceptions can be made only in documented cases of illness or emergencies. This also means not taking any irregular holidays other than the ones that appear on the College’s formal Academic Calendar. Students who miss a seminar class(es) without an adequate (documented) excuse risk failing the course with a grade of FX.

OUTLINE: Mathematics Seminars is typically taken during the junior and senior years. In these courses, students are required to attend all of the talks given by the seniors in MAT 480 as well as occasional talks given by faculty or visitors. They also meet once a week with the faculty supervisor to discuss and evaluate these seminars. In addition, students will prepare and present one or more talks accompanied by written paper(s) covering the topics(s) in more detail. The duration and intensity of the talk(s) will depend on which seminar section the student is enrolled in (see below). These talks are to be given to the other students in their section in MAT 380/381, and to the whole department in MAT 480.

Students will be instructed on information literacy as it applies to mathematics and statistics, and they will develop skills in reading mathematics and in presentation of ideas. Technical tools will be demonstrated and the students will begin to use them, such as \LaTeX for writing complex mathematical expressions, Beamer for presentations, and softwares like MATHEMATICA, MATLAB, OCTAVE, R, and Geometer’s Sketchpad for computation and graphics. In addition, professional topics will be discussed, such as careers in mathematics, graduate study, the GREs, actuarial exams, and the procedure for applying for summer research programs and graduate schools.

TALK DURATIONS: MAT 380: 10 minutes; MAT 381: 25 minutes; MAT 480: 45 minutes
- The seminar talks should include some serious mathematical content that is not included in a course that is offered by the department. Something new please!
- Each talk will be preceded by a short pre-presentation, a week or two prior, giving a brief synopsis, background, or introduction.
- After the talk, a written report will be submitted. Detailed instructions are given below.

GRADING: The following four items will be considered:

(1) Participation and minor presentation(s): 10%
(2) \LaTeX and/or other software assignments: 20%
(3) Major presentation: 50%
(4) Written report: 20%
WRITTEN REPORT: Each seminar speaker will support his/her talk with a written report. This written report will be due 10 days after the seminar is given (by the end of the following week). It may be submitted electronically. MAT 380 and 381 students are required to write a one page report. MAT 480 students are required to write a two-page report. These reports will be prepared using $\LaTeX$ under the “report template”, which will be provided. The font size is intentionally set at 10pts.

The seminar reports are not to be a summary of your talk (So don’t do something like “In my talk I first … then I …”). Instead, the report should be on the same topic as your talk and it should support your talk by providing additional information. You may for example, take an important point or theme in your talk and expand upon it. For example, suppose you gave a seminar talk about game theory but you only touched lightly on Nash equilibria. Then a perfectly good report on such a seminar could expand at length upon Nash equilibria. In general, there should be some substantial new information on the topic of your seminar in your report. Reports must be crisply written narratives and they must be grammatically correct.

It is also the case that seminar reports must include a proper bibliography that includes hard references: published journal articles or published books. Moreover, all references in your bibliography must be properly cited within the text of your report. You may not put items in the bibliography that are not cited in the body of the report. A suggested referencing style is the Harvard Referencing Style.

Departmental Assessment Goals and Objectives:

- Reinforce Goal 1: Objective A: Statements

  Goal 1: Mathematics majors will perform tasks requiring logical reasoning.

  Objective A: Understand the different types of mathematical statements and how they are used, including definitions, axioms, hypotheses, conclusions, theorems, corollaries, lemmata, and conjectures.

  Basic Skills Description: The Department expects students to understand the different types of mathematical statements. Such a mathematical statement might be a definition, an axiom, an assumption or hypothesis, a conclusion, a theorem, corollary, or lemma, or a conjecture. Students must understand the differences between these roles and their use in mathematics. Students should also know the basic definitions and axioms of each major mathematical field and the statements of the most important theorems.

- Reinforce Goal 1: Objective A: Statements

  Goal 1: Mathematics majors will perform tasks requiring logical reasoning.

  Objective B: Understand methods of proof.

  Basic Skills Description: The Department expects students to understand several methods of proof, including direct proof, proof by contraposition, proof by contradiction, proof by induction, and disproof by counterexample.

- Emphasize Goal 3: Objective A: Information literacy

  Goal 3: Mathematics majors will advance their understanding and knowledge of mathematics and their ability to convey mathematical concepts through currently available technology.
Objective A: Information literacy: Students will use the internet and/or library resources to obtain relevant information concerning historical information or mathematical content in regards to a current course or project. Students will be expected to both look up sources and learn to search for their own sources.

Basic Skills Description: The Department expects students to be able to look up mathematical concepts on the internet or using library sources. As a student gains experience, the burden of where to search will shift to the student. They will be given broad topics and be expected to search for their own sources.

- Emphasize Goal 4: Objective C: Explanation of concepts
  
  Goal 4: Mathematics majors will communicate mathematical ideas with precision and clarity.

  Objective C: Explain mathematical material.

  Basic Skills Description: The Department expects students to be able to explain mathematics clearly. Students should demonstrate that they understand audience and purpose and can frame their presentations to facilitate learning. Students should be able to convey information clearly and coherently and to develop concepts in an organized and logical manner.

- Assess Goal 3: Objective B: Computation
  
  Goal 3: Mathematics majors will advance their understanding and knowledge of mathematics and their ability to convey mathematical concepts through currently available technology.

  Objective B: Computation: Students will be expected to use computers or graphing calculators to perform labor-intensive calculations and/or create graphical displays. Programs include, but are not limited to, Excel, Minitab (or other statistical software), and Mathematica (or other software).

  Basic Skills Description: The Department expects students use technology to perform tedious and complicated tasks using modern technology (computers and/or calculators). This allows students to see the applied and practical side of mathematics. Students will be expected to master some software program in a manner that allows calculation of the otherwise “impossible” calculation.

- Assess Goal 3: Objective C: Technology for presentation
  
  Goal 3: Mathematics majors will advance their understanding and knowledge of mathematics and their ability to convey mathematical concepts through currently available technology.

  Objective C: Presentation: Students will be expected to use technology for the purpose of elegantly presenting mathematical ideas, theories, or results. Technologies include PowerPoint, Prezzi, Jing, Beamer, LaTeX, Word, and graphical tools.

  Basic Skills Description: The Department expects students use technology to properly and elegantly display their ideas calculations, and conclusions.

- Assess Goal 4: Objective A: Written communication
  
  Goal 4: Mathematics majors will communicate mathematical ideas with precision and clarity.
Objective A: Present mathematical material in writing.

Basic Skills Description: The Department expects students to be present mathematical knowledge in writing. Students should be able to convey written information clearly and coherently and to develop concepts in an organized and logical manner.

- Assess Goal 4: Objective B: Oral communication

Goal 4: Mathematics majors will communicate mathematical ideas with precision and clarity.

Objective B: Present mathematical material orally.

Basic Skills Description: The Department expects students to present mathematical knowledge orally. Students should demonstrate that they understand audience and purpose and can frame their presentations to facilitate learning. Students should be able to convey information clearly and coherently and to develop concepts in an organized and logical manner.

Core Curriculum Oral Communication Attribute Goals and Objectives:

Content:

Goal: Students will compose a message [sic] and provide ideas and information appropriate to its topic, audience, setting, and purpose.

Students will:

(1A) Identify the components of effective oral communication of an idea with an argument or thesis supported by evidence.

(1B) Demonstrate the knowledge of how to select appropriate material that will be understood by the audience.

(1C) Apply organized and explanatory strategies suitable to the topic, audience, setting and purpose of the message that is being delivered.

Skills:

Goal: Students will demonstrate the ability to deliver effective oral presentations.

Students will:

(2A) Speak clearly and employ a rich and imaginative vocabulary with diction and pronunciation appropriate to the context.

(2B) Present fluently, maintain eye contact with the audience, and use gestures appropriate to the context.

(2C) Define the thesis and/or purpose of the message, use smooth transitions from one section to the next, and end with a clear and direct conclusions.

(2D) Demonstrate the effective and judicious use of detail and evidence in substantiating and/or illuminating the presentation’s central thesis.
Students with Disabilities:
In accordance with College policy, if you have a documented disability and require accommodations to obtain equal access in this course, please contact me or a relevant college official at the beginning of the semester or when given an assignment for which an accommodation is required.

Academic Integrity:
Note College’s Code of Academic Integrity, found at:
http://catalog.canisius.edu/undergraduate/academics/academic-policies/code-academic-integrity/
In any presentations or written reports, this policy will be strictly enforced.