MAE 301/501 FOUNDATIONS OF SECONDARY SCHOOL MATHEMATICS

FALL 2019

Instructor: Lisa Berger
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Current Office Hours:

Tuesdays: 10:00-11:00 in room P-143, 11:00 - 12:00 in 4-100A
Thursdays: 11:30-12:30 in 4-100A

Office hours may be adjusted to accommodate the instructor's schedule and/or student needs. Students unable to meet during scheduled office hours are encouraged to schedule an appointment with the instructor.

Semester Schedule. We will not meet in class on Tuesday, October 8, or on Tuesday, October 22. In place of these classes, each student will schedule a time to take Exam 1 before the end of September.

General Information.

This is a course in mathematics. We will study many of the topics that are studied in the high school curriculum at an advanced level. One goal of the course is for students to make connections among different areas of mathematics and between high school and advanced mathematics. This course may include both new and familiar topics; your goal should be to increase your depth of understanding of each topic studied. A main focus of the course will be on mathematical problem solving, proof, and writing mathematics. You should be prepared to work through a lot of problems, prove your results, and write your work clearly and accurately. We will study a range of topics selected from the areas of algebra, geometry, trigonometry, functions, probability and statistics.

Learning Objectives:

- Students know, understand, and apply the process of mathematical problem solving.
- Students reason, construct, and evaluate mathematical arguments and develop an appreciation for mathematical rigor and inquiry.
- Students communicate their mathematical thinking orally and in writing to peers, faculty, and others.
- Students recognize, use, and make connections between among mathematical ideas and in contexts outside of mathematics to build mathematical understanding.
- Students use varied representations of mathematical ideas to develop and communicate their mathematical understanding.
- Students select and use appropriate technological tools.
- Students demonstrate computational proficiency, including a conceptual understanding of numbers, ways of representing number, relationships among number and number systems, and meanings of operations.
- Students emphasize relationships among quantities including functions, ways of representing mathematical relationships, and the analysis of change.
- Students use spatial visualization and geometric modeling to explore and analyze geometric shapes, structures and their properties.
- Candidates demonstrate a conceptual understanding of limit and continuity and of their relevance to the secondary curriculum.

- Students apply some of the fundamental ideas of discrete mathematics in the formulation and solution of problems.
- Students demonstrate an understanding of concepts and practices related to data analysis, statistics and probability.
- Students apply and use measurement concepts and tools.

Course Materials. There is no required textbook for this course, so students should plan to consistently maintain high quality class notes. Students are also encouraged to refer to textbooks and notes from earlier coursework, and each student should become familiar with the New York State Next Generation Mathematics Learning Standards, including the Standards for Mathematical Practice:

`http://www.nysed.gov/curriculum-instruction/new-york-state-next-generation-mathematics-learning-standards`
`http://ime.math.arizona.edu/progressions/`
`http://commoncoretools.wordpress.com/`

Course Notes. Course notes will be prepared and distributed by the students throughout the semester, with guidance from the instructor. Each student will be assigned up to two dates to be responsible for taking quality notes on the class discussion and writing them up for distribution. Prior to class distribution, notes will be edited by the student in order to earn a grade. Each version of the notes will be considered in assigning a final grade, and a late submission will not receive full credit. Contribution to the course notes represents 10% of the final course grade.

It is the student's responsibility to exchange dates with another student in the case of an unavoidable absence from class.

Homework/Class Work/Quizzes.
Homework is an essential component of the course. Homework will be assigned and collected regularly, and selected problems will be graded. Late homework will not be accepted. Announced and/or unannounced quizzes may be given, and there may be assignments completed and collected during class. Students are expected to be present for class, and missed quizzes and classwork may not be completed for credit. The lowest 2 scores in the homework/classwork/quiz category will be dropped.

Guidelines for Course Notes.

Deadlines. Course notes for an assigned class are due at the next class meeting for which no exam is scheduled. If editing is necessary then a revised version will be submitted to the instructor at a time determined by the instructor. The student is responsible for class distribution, (which may be electronic), of the final version.

Format. The course notes should be a complete and organized account of the mathematics discussed in class, but you are not required to present topics in the order in which they were covered in class. Indeed, part of the work is in determining the structure of the presentation. Your notes should include any new theorems, definitions, ideas, and examples studied that day. Include also at least one new example and one new question for your classmates. You may choose to answer an open question that came up during class. If some ideas are not yet clear, you may also include questions for the instructor. The instructor may either address these questions directly or suggest sources for further study.

0.0.1. This is an exercise in *writing mathematics*. The final product should be clear and grammatically correct, in addition to mathematically accurate. The notes must be accurate and complete, so that all students may refer to them for future study.

Exams.

There will be three exams. Exam 1 will consist of problems selected from the New York State Regents Exam. Exam 1 is, tentatively, to be individually scheduled before the end of September. Students who do not achieve a score of at least 85% on Exam 1 will have two opportunities to to pass a make-up exam. There will be a midterm exam and a final. The midterm is tentatively scheduled for **Thursday, October 10**. The **final exam** is as scheduled by the University, for **Tuesday, December 17**, from 11:15 a.m. to 1:45 p.m.

Final Grades.

In order to earn a grade above $C-$ in this course a student must achieve a minimum score of 85% on Exam 1 or on a subsequent make-up exam. For students passing Exam 1 with a minimum score of 85%, the grade is determined as follows:

(1) Exam 1: 10%
(2) Homework/Quizzes/Classwork: 20%
(3) Course Notes: 10%
(4) Midterm Exam: 30%
(5) Final Exam: 30%

A student not passing Exam 1 with a minimum score of 85% will not receive above a $C-$ for the course.

Academic Integrity:

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at `http://www.stonybrook.edu/commcms/academic_integrity/index.html`

If you have any questions about the academic integrity expectations, please ask.

Student Accessibility Support Center: If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Student Accessibility Support Center, ECC (Educational Communications Center) Building, Room 128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: `http://www.stonybrook.edu/ehs/fire/disabilities`]

Critical Incident Management: Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.