Syllabus - MATH 295 - Introduction to Abstract Mathematics, Spring 2016

Course Information

Instructor: Dr. Justin T. Webster
Lecture: T, R; Sec. 1 - 1:40–2:55pm, Bellsouth 310;
TA: Lauren Tubbs

Course Website: [http://websterj.people.cofc.edu/JustinsHomepageForStudents.html](http://websterj.people.cofc.edu/JustinsHomepageForStudents.html)

Office Hours: M, 4:00–5pm; T, 3:15–4:45pm; W, 10:00–11:30am, and by appt.*

This is a three credit-hour course which is intended to provide a transition from the calculus sequence to more advanced courses requiring an ability to do proofs. Topics include: elementary propositional logic, set theory, mathematical induction, functions and relations, and cardinality of sets.

This is a reading and writing intensive course meant to expose students to the concept of “proof”. Students will learn the context and necessity of proof in general, as well as various proof techniques and basic proof writing skills. The goal is for students to learn how to write perfect proofs in rather general situations. Prerequisites: Math 203 or 221.

The following are the course policies, which may be changed at any time; changes will be announced in class.

Contacting Me: I will typically be in my office during office hours. If I am not, I will post a note on my door. The best way to contact me is via email. I will respond within 24 hours, but do not expect an immediate response. *Please schedule all appointments outside of office hours through e-mail, with at least 24 hour notice. Students are responsible for all announcements made in class, and any e-mail sent to the primary CofC email account! Announcements and files to download will be posted on the course website (listed above), and sometimes on OAKS (the College’s central information system, via MyCharleston). Please check these sources often. (I recommend checking the course website—via my homepage—every other day.)

Reading/Activities: This course (and, in particular, this textbook) necessitate the intensive reading of mathematics—definitions, theorems, proofs, and discussions of proofs. As such there will be weekly required reading (with due dates) posted on the homepage. This text also has a plethora of group/classroom activities which will be graded (sometimes for completion). Many of these in-class activities will assume the student has completed the required reading beforehand.

Assignments: Weekly homework will be assigned (in addition to the mandatory reading) with due dates given on the homepage. A broad range of question types will be assigned, and the nature of the homework may change as we move through the text book. Solutions will be required to be typeset (see below).

LaTeX: This course will utilize LaTeX. LaTeX is type-setting software utilized by the mathematics (and greater STEM community) for cleanly, clearly, and efficiently writing and presenting mathematics. It does take some getting used to, and can be frustrating at first, but in the long run it will save you time and energy, and accelerate your transition to mathematical maturity. I will provide templates when possible. Please see the following site to obtain a LaTeX package on a personal computer: [https://latex-project.org/ftp.html](https://latex-project.org/ftp.html)

If you do not want to (or cannot), you can use hosted environments: [https://www.sharelatex.com/](https://www.sharelatex.com/) or [https://www.overleaf.com/](https://www.overleaf.com/)

Quizzes: An in-class or take home quiz will happen (approximately) every other week. It may be longer (30 min, a semi-test) or shorter (5 min, a basic comprehension or definition check), depending on the material. Once material is covered in class, it is valid for quizzes and assignments. *No make-ups will be granted under any circumstance, but you will be permitted one quiz drop (the lowest score).* There will be no 75 minute tests during the semester.

Term Paper: In week 5 or 6 (after a sufficient amount of preliminary material has been covered) a term paper will be assigned, due on the last day of class (Apr. 21). The term paper will be a research paper (with in-text citations) of approximately 10 pages (double-spaced), covering an advanced topic of the student’s choosing from mathematical philosophy (a handful of prompts will be suggested). The goal is for students to utilize what they have learned about the basics
of mathematical logic and proof to read about, absorb, and explain some fundamental problems/paradoxes/oddities of modern mathematics.

**Final Exam:** There will be a comprehensive final exam with a date and time determined by our class meeting time (see below). The date and time of the final are absolutely fixed, and only in the most extreme cases will arrangements be made to reschedule.

Final Exam - Tuesday, Apr. 26th, 4:00–7:00pm

**Notes Policy:** Books and notes are not allowed for any quizzes or the exam unless explicitly stated otherwise.

**Grading:** Grades will be assigned based on raw percentages in the standard 100 percent scale, with the top and bottom three percent of each 10% grade range given a ‘+’ or ‘−’, respectively. During the semester, grades will not be rounded, and there will be no curve for quizzes or work. However, I reserve the right to adjust final grades based on factors such as attendance, participation, and demonstrated effort towards understanding the material. I also reserve the right to perform a “mean-shift” to the the final course distribution (always “upward”, if at all). The final grade breakdown is as follows:

Final Exam – 35% Assignments – 25% Quizzes/Activities – 25% Term Paper – 15%

In this course I will assign midterm grades (which have no ultimate bearing) based on the following breakdown:

Homework – 50% Quizzes – 50%

**Course Specific Student Learning Outcomes:** Students are expected to display a thorough understanding of the topics covered. In particular, upon completion of the course, students will be able to:

- write basic proofs about integers and sets
- have basic facility with propositional logic, including truth tables and compound statements
- understand and utilize quantifiers and be able to negate complex statements
- utilize common proof techniques
- understand principles of induction and write induction based proofs
- understand functions and relations
- understand equivalence relations and partitions
- discuss and describe cardinalities of sets, including infinite sets

These outcomes will be assessed on homework, quizzes, and the final exam.

**Etiquette, Please:** Make sure your cell phone is silent, and *do not use laptops or cell phones during class.* If in attendance, please commit to sitting through the entire lecture. Lastly, please comment and ask questions during the lecture by raising your hand.

**Attendance:** Attendance will be taken during the first two weeks for administrative purposes. Attendance is not mandatory, though quizzes will be given somewhat randomly. Attendance will not factor into the overall grade, but there are obvious ramifications for missing more than a couple class sessions. Additionally, I reserve the right to withdraw a student due absences in excess of 6 class meetings.

**Getting Help:** *Do not wait to get help if you need it.* The smallest confusion can compound and have dire effects on one’s understanding (and hence, grade). I strongly encourage each student to visit my office hours, or Lauren’s, or make an appointment.

**Athletics and Special Needs:** If you are a NCAA or club sports athlete, or have any special circumstances, you should inform me as soon as possible. Special accommodations can be made for scheduling and other specific needs
on an individual basis. For disability related needs, documentation may be required. The College will make reasonable accommodations for persons with documented disabilities. Students should apply at the Center for Disability Services/SNAP, located in the Lightsey Center, Suite 104. See [http://disabilityservices.cofc.edu/](http://disabilityservices.cofc.edu/) Students approved for accommodations are responsibility for notifying me as soon as possible and for contacting me one week before accommodation is needed.

**Important Dates:** Please be aware of the following dates:

- drop deadline - Monday, Jan. 11;
- MLK Day - Monday, Jan. 18;
- spring break - Mar. 6th–13th;
- withdrawal deadline - Friday, Mar. 18;
- last day of classes - Thursday, Apr. 21;
- absence withdrawal date - Monday, Feb. 8;
- midterm grades available - Monday, Mar. 14;
- reading day - Friday, Apr. 22;
- finals - Apr. 23–29;

**Honor Issues:** Do not cheat! If I find out, I will make it extremely embarrassing for you; and otherwise, cheating makes you a bad person. The academic environment is hallowed, and by cheating you are taking advantage and “cheating” your institution, this class, and each of your fellow students (not to mention yourself—you’re studying advanced mathematics for a reason, right?). I do encourage students to work together, but do not copy from other students and read all directions on assignments and tests. Bear in mind that you are under the CofC Honor Code: [http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php](http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php).

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each instance is examined to determine the degree of deception involved. Incidents where the professor believes the student’s actions are clearly related more to ignorance, miscommunication, or uncertainty, can be addressed by consultation with the student. We will craft a written resolution designed to help prevent the student from repeating the error in the future. The resolution, submitted by form and signed by both the professor and the student, is forwarded to the Dean of Students and remains on file. Cases of suspected academic dishonesty will be reported directly to the Dean of Students. A student found responsible for academic dishonesty will receive a XF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student’s transcript for two years after which the student may petition for the X to be expunged. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board. It is important for students to remember that unauthorized collaboration—working together without permission—is a form of cheating. Unless a professor specifies that students can work together on an assignment and/or test, no collaboration is permitted. Other forms of cheating include possessing or using an unauthorized study aid (such as a PDA), copying from another’s exam, fabricating data, and giving unauthorized assistance. Remember, research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the professor.

Students can find a complete version of the Honor Code and all related processes in the Student Handbook.

**Course Evaluations and Feedback:** I take course evaluations seriously, and as such, I would ask that you complete them. In addition, this is the first time I will be teaching this course. Please provide objective and honest feedback through the OAKS system. I will provide around 15 minutes on the final day of class for you to complete course evaluations (though you may certainly complete them on your own time outside of class). Additionally, polite feedback about the course (during the semester) is encouraged.