Bridge to Advanced Mathematics
MATH 308, Section 1XB, Summer 2018
T, W, Th 10:30am – 12:10pm, Shepard S-308

Instructor: Jhevon Smith. ("Jhevon" is fine.)
Email: JhevonTeaches@gmail.com
Office Hours: By appointment only.
Website: http://math.sci.ccny.cuny.edu/people?name=Jhevon_Smith
Texts: (1) Chartrand, Polimeni, and Zhang; *Mathematical Proofs: A Transition to Advanced Mathematics*, 3rd Edition. https://www.amazon.com/Mathematical-Proofs-Transition-Advanced-Mathematics/dp/0321797094
   (2) Ross; *Elementary Analysis: The Theory of Calculus*, 2nd Edition.
https://link.springer.com/book/10.1007%2F978-1-4614-6271-2
Math Dept.: NAC 8/133   **Math Dept. website:** http://math.sci.ccny.cuny.edu
Math 308 website: http://math.sci.ccny.cuny.edu/courses?name=Math_30800

Websites: I gave you my website since I will be posting documents and instructions for the class there, such as: review topics, announcements, solutions to tests, etc. I gave you the Math 308 website because you can download a free copy of textbook (2) there, while you're on campus (or you can follow the link above while you're on campus). I gave you the math. dept. website because, well, you should have it.

Calculators/Technology: While you may use these to do your homework or explore some topics in depth, you will not be allowed to use them on any exam. They wouldn't help much anyway.

Grading: Grades will be assigned according to the following non-standard grade chart.

Letter Grade	G.P.A.	Grade	Letter grade	G.P.A.	Grade
A$^+$	4.00	97-100	C+	2.33	67 - 69
A	4.00	91-96	C	2.00	60-66
A$^-$	3.66	80-90	**D**	**1.00**	**50-59**
B$^+$	3.33	77-79	**F**	**0**	**Below 60**
B	3.00	74-76			
B-	2.66	70-73			

As department policy demands, the final exam is worth 40% of your grade in this course. The remaining 60% will come from your in-class grade; the breakdown of your numerical grade will be as follows:

HW: 15% (See exercises in the Topics and Assignments table; I will grade selected problems).
Participation: 5% (Based mostly on attendance, the only mercy you will get in this class).
In-class tests: 40% (I will give two exams, none will be dropped).
Final Exam: 40% (This will be a cumulative exam given at the end of the course).

There are three exams total. There are no make-ups—please don't miss any exam.

Attendance: Attendance will be taken at the beginning of class. You are *late* if you arrive after your name is called. You will be assigned a WU (failing) grade if you accumulate 5 unexcused absences.

To be excused for an absence (or lateness) you must email me no later than one day after that particular absence (or lateness) with the reason. Of course, proof is required where applicable. For example, if your absence or lateness was due to a medical emergency, I expect to see a doctor's note. If you miss a class, it is your responsibility to catch up. You can see me during my office hour to discuss what was done in class, or catch up on your own. It's up to you.

My Expectations:
Work ethic: You are not to slack off! You are to read ahead! Very Important! Read each section before coming to class. It's better if you have your mind working on the concepts before coming to class—it will be easier for you to keep up and ask intelligent questions. Make note of definitions and notation especially. You will find that knowing the definitions and knowing how to write something down clearly and with the right notation is half the battle. Read (intelligently) and do the homework. It is highly unlikely that you will do well by just coming to class, even if you pay attention. Hopefully by now you've realized, watching someone do math on the board is different from doing it yourself.

Responsibility: This is a non-trivial math class, and as such, I do expect a certain level of responsibility, maturity, and integrity from you. You've made it this far, which means you know what it takes to get through a college-level math class. This class may be a little (or very) different for you if you've never seen proofs before, but I expect you to apply diligence to bridge the gap between your comfort zone and what's required here. We all have to do this at some point. No excuses, and no begging for grades at the end of the semester. And no sob stories. Understand, that while I want to see every one do well and have no ill will towards anyone, it is *not* my responsibility to keep your GPA up, or to help you keep that scholarship, or whatever reason it is important that you do well here. These are your responsibilities. My responsibility is to facilitate you learning the course material. I shall keep that responsibility. Please keep yours.

Homework: The list of assigned homework problems from the texts can be found towards the end of this syllabus. Once a chapter is complete, the homework for that chapter is due the next class—whether I announce it or not. (It is probably best that you do the HW for each section as we progress and not leave everything for the night before the due date. If you're not sure whether HW is due, it is best to just ask me.) I will grade selected problems from each HW set and that will make up half your HW grade. The other half of your HW grade comes from how well you adhere to the submission guidelines outlined below. **Late homework will NOT be accepted.** The excuse does not matter.

Submission guidelines for homework:
I expect your hand-in homework to follow certain guidelines (**you lose points otherwise**):
(1) Show all your work, writing down your full solutions clearly. This goes for homework and *everything* else you do in this class.
(2) Your homework must be stapled if it consists of more than one page.
(3) Your homework must be properly labeled: **Your name, the HW number *and* topic(s)** (see the assignment table for what these are).
(4) Only ONE HW number per stapled group.
(5) Be neat! And write legibly, for Pete's sake! Make sure your definitions are correct!

More expectations: I also expect you to remember all the math that you have done before this course. We usually won't specifically use things that you've done in, say, calculus, but I expect a level of mathematical maturity befitting those who are experts at the lower level math courses. I'd like the freedom to use examples from anywhere, including calculus, without losing the class. I think highly of you and will treat you accordingly. I will heavily punish any elementary/fundamental mathematical mistakes. Such things are now beneath you.

In my lower-level classes, I have a list of blasphemies—mistakes that you must never make, lest you get zero for the problem in which you make them. In this class, we will only have one such thing: Not knowing a definition! **If you misquote a definition or otherwise write down a statement that makes it clear you do not know the precise statement of a relevant definition, you will get a zero for that problem—regardless of what you write otherwise.**

Contact:

I will be emailing important information from time to time; including progress reports, announcements and advice as needed (to the email address listed for you on BlackBoard. If this is not a good email address, notify me). Please read the emails. If I email you, it means it is important.

Feedback: I encourage you to give me feedback about my teaching or the class, whether positive or negative (just make it constructive please). You can email me or talk to me, or if you don't want to reveal your identity, there is an anonymous feedback page on my website.

Help: FREE tutoring is available in the Marshak Building, room 403. The hours for this semester are: Mondays through Thursdays 12pm – 5pm. Tutoring begins on June 11th. There are also online resources available. A great place to get math help, even at odd hours, is www.mathhelpforum.com. Mathhelpboards.com is also nice, as is math.stackexchange.com. There are a significant number of brilliant people from varying time zones who decide to spend their free time helping others with math at sites like those. Take advantage of these great services. Of course, there are other online contenders like various YouTubers, Khan Academy, etc. Check them out. And don't forget your classmates. You should get the contact information of at least one person that you can study with or get missed notes from if you are absent, etc. You're all in this together, help each other out. And, of course, there is always me! Don't be afraid to come to me if you have questions or concerns. You can contact me via email or see me after class or during my office hour.

Some class rules: Please silence your cell phones and don't use them when in class. Eating in class is NOT allowed. Drinking is permitted, as long as you remove your garbage afterwards.

Academic Integrity: Any act of academic dishonesty will be dealt with by applying the most stringent penalties permitted. Cheating includes, but is not limited to, receiving help during exams and submitting homework without properly acknowledging persons who assisted you. Please read carefully the Policy on Academic Integrity posted on the CUNY website with URL http://www1.cuny.edu/portal_ur/content/2004/policies/image/policy.pdf

Important Dates:

You can view the full academic calendar at: https://www.ccny.cuny.edu/registrar/summer-2018-academic-calendar-extended-session

June 4	First day of summer classes. Yay!
June 8	Last day to add a course or apply for an audit; last day for 50% tuition refund.
June 13	Last day to drop without earning a "W"; last day for 25% tuition refund; last day for "WD" grades.
June 14	"W" grades begin; no refund
July 3	Deadline to file for Summer 2018 graduation
July 4	Independence Day – College closed.
July 5	Last Day to withdraw from a course; last day for pass/fail option.
July 23	Last day of classes
July 24-25	Final Exams

Topics and Assignments:

HW #	Section	Topic	Problems to do
		From the Mathematical Proofs Text (1)	
*	0	Communicating Mathematics	Read on your own
1	1.1- 1.6	Sets	Chapter 1 Exercises: 1 – 5 all, 10, 14, 15, 16, 19, 22, 26, 36, 37, 38, 41, 47, 48, 50, 57, 58
2	2.1 – 2.10	Logic	Chapter 2 Exercises: 1, 3, 11, 15, 16, 22, 34, 35, 46, 47, 48, 51, 53(a),
3	3.1 – 3.4	Direct Proof and Proof by Contrapositive	Chapter 3 Exercises: 3, 8, 10, 12, 16, 18, 19, 26, 28, 29, 31
4	4.1 – 4.6	More on Direct Proof and Proof by Contrapositive	Chapter 4 Exercises: 1, 4, 5, 14, 18, 32, 40, 43, 49, 53, 56, 62, 67
5	5.1 – 5.5	Existence and Proof by Contradiction	Chapter 5 Exercises: 1, 10, 16, 18, 19, 20, 21, 34, 40, 41, 42, 49
6	6.1 - 6.4	Mathematical Induction	Chapter 6 Exercises: 1, 2, 3, 4, 8, 11, 20, 22, 23, 29, 30, 33, 41, 43, 44
7	7.1 - 7.3	Prove or Disprove	Chapter 7 Exercises: 30, 34, 59, 61, 64, 79
*	**Test #1**	**On topics 1 through 7**	**Given in class**
8	8.1 - 8.6	Equivalence Relations	Chapter 8 Exercises: 1, 5, 11, 12, 15, 18, 25, 28, 30, 38, 44, 51, 58, 59
9	9.1 - 9.6	Functions	Chapter 9 Exercises: 1, 11, 12, 13, 18, 19, 20, 30, 31, 32, 40, 43, 46, 59
10	10.1 - 10.5	Cardinalities of Sets	Chapter 10 Exercises: 3, 9, 10, 11, 12, 20, 22, 23, 27, 28, 30, 32, 44
		From the Elementary Analysis Text (2)	
11	1.2	The set of rational numbers	1, 2, 3, 4, 7
12	1.3	The set of real numbers	1, 3, 4, 5, 6(b), 7, 8
13	1.4	The Completeness Axiom	1 (one upper bound each), 2, 3, 4, 6, 7, 8, 9, 10, 11, 14, 16
14	1.5	Infinity!	1, 4, 6
*	**Test #2**	**On topics 8 through 14**	**Given in class**
*	1.6 and selected topics if time permits		Exercises TBA if applicable
*	**Final Exam**	**Covers Everything!**	**Wednesday July 25, 10:30am – 12:45pm in regular classroom**

The exercises above are the minimum that need to be done and handed in. It is a very good idea to do more problems beyond these, whether or not you're having trouble with a topic. I may post additional practice problems and will announce if I do, but the text has many problems to work with.

COURSE LEARNING OUTCOMES

DEPARTMENT: Mathematics **COURSE #: 30800** **COURSE TITLE: Bridge to Advanced Mathematics** TERM OFFERED: Summer 2018 PRE-REQUISITES: A grade of C or higher in MATH 20300 or placement by the Department PRE/CO-REQUISITES: None HOURS/CREDITS: 3hrs/3credits DATE EFFECTIVE: 5/4/18 COURSE COORDINATOR: Hooper	**CATALOG DESCRIPTION :** This course explores the logical and foundational structures of mathematics, with an emphasis on understanding and writing proofs. Topics include set theory, logic, mathematical induction, relations and orders, functions, Cantor's theory of countability, and development of the real number system. Typical Textbooks Used: (Actual textbooks used is instructor dependent.) • *Mathematical Proofs*, 3rd edition, by Chartrand, Polimeni, and Zhang; Addison-Wesley Publ. • *Elementary Analysis*, 2nd edition, by Ross, Springer Publ.

COURSE LEARNING OUTCOMES:

After taking this course, the student should be able to:	Contributes to Departmental Learning Outcome(s):
1. Demonstrate an ability to understand and manipulate mathematical statements involving quantifiers and logical connectives. Examples of manipulations include finding the negation, converse, and contrapositive of a quantified implication.	a, g
2. Write clear and rigorous proofs (or disproofs) of mathematical statements utilizing basic proof techniques including direct proof, proof by contrapositive, proof by contradiction, proof by cases, mathematical induction, and by providing an example (or counterexample).	e1, e2, f, g
3. Demonstrate knowledge of fundamental concepts of mathematics including those relating to logic, sets, functions, relations, cardinality, integers, rationals and reals. Precisely state fundamental definitions, axioms and theorems and utilize them to prove related results.	a, e1, e2, f, g

COURSE ASSESSMENT TOOLS:

Left up to instructor. (Instructor: Please adjust and insert percentages.) Typical assessment tools:

1. Attendance
2. Homework and/or Quizzes
3. Midterms
4. Final Exam

DEPARTMENTAL LEARNING OUTCOMES:

The mathematics department, in its varied courses, aims to teach students to:
   a. perform numeric and symbolic computations
   b. construct and apply symbolic and graphical representations of functions
   c. model real-life problems mathematically
   d. use technology appropriately to analyze mathematical problems
   e. state (e1) and apply (e2) mathematical definitions and theorems
   f. prove fundamental theorems
   g. construct and present (generally in writing, but, occasionally, orally) a rigorous mathematical argument.

Anonymous Questionnaire

What is your major? _____

Are you sure you need this class? _____ Are you sure? _____

Will you need to do more math after this? _____

What is the highest math class you've taken? _____

If you don't *need* this class, why are you taking it? _____

_____

Have you ever taken a mathematical proofs class before? _____

Rate your interest: 5 = math is my life and I'm so excited to be here, down to 1 = I don't really
like math, but I'm just here to get a minor or satisfy some requirement. _____

How good are you at Algebra? _____ Precalc? _____ Calc 1? _____ Calc 2? _____ Calc 3? _____
            Linear Algebra _____?
(Enter 5 for "I can do it in my sleep!", 4 for "I'm not the best at it, but pretty awesome.", 3 for
"I'm just OK; I'm good at the basics.", 2 for "I'm not the worst, but far from the best.", 1 for
"The class was a blur that got more obscure over time!")

Are there any dates during the semester for which you will not be able to take an exam due to
religious reasons? If so, please state the date(s) and "occasion(s)" below.

_____

_____

Any general feelings or concerns towards this course? (For example, are you: Scared? Excited?
Curious? Indifferent? Based on your perceived ability in math, what grade are you expecting?
etc)

_____

_____

_____

Are there any other relevant comments that you wish to add?

_____

_____

_____