Math 4389-Section 14595–Survey of Undergraduate Mathematics. Summer IV Semester, 2025.

Time and Place: MWF 12-1:50 in SEC 201 (location may be moved).
Instructor: Dr. David Blecher, 627 PGH, email: dpbleche@central.uh.edu
Office Hours: The hour after class MWTh, or on Teams (send me an email and I will send a Teams invite), or in my office by appointment).
Office phone number: 713-743-3451.
Graders/Tutor's details and office hours:
Caleb McClure (cbmcclur@CougarNet.UH.EDU, PGH 6XX, Office hours or MUSL tutoring hours to be announced)
CCS/CASA is used only for EMCF answers, most everything else is on Canvas or on the:
Course website: `http://www.math.uh.edu/~dblecher/4389.html`
Teams is used only for occasional online lecture.
Text: No textbook required. Notes and all other class material will be provided.
Last date to drop with refund or not having it count towards the 'allowed drops'/enrollment cap:
(ORD date) July 10, 2025.
Prerequisites: Math 3331, Math 3333, and three hours of 4000- level Mathematics.
It would be also be helpful if you have taken Math 3330, and a course in basic probability, but this is not required.
Last date to drop with W: July 28, 2025.

Your instructor reserves the right to make changes to the syllabus/grades/policies of the course and to announce such information as needed. Indeed a few such changes are to be expected given the COVID and other emergency guidance coming from the department and university, questions and issues that arise, etc. You are responsible for knowing the content of any announcements concerning changes.

Course description/Course Objectives: A problem-based revisit of some of the most important topics in the undergraduate mathematics curriculum. The two main Course Objectives, which are somewhat different (i.e. distinct), by the end of the course 1) you will have had a somewhat honest review of the main content of several important undergraduate math classes, and have brushed up on, and hopefully improved on, your mastery of much of that material, and 2) you will be prepared to take a national standardized test, the Major Field Test in Mathematics (or Math GRE test).

Math 4389 is a sequence of short modules reviewing courses and important concepts from our undergraduate mathematics curriculum: calculus, linear algebra, algebra, differential equations, analysis, and probability. It is possible that you have not studied a couple of these subjects, but such modules are designed to be somewhat self-contained. It is important to keep up to date. Taking it as a summer course it is extremely packed. Remember the old College rule of three hours outside of class for every hour in class. Thus according to this rule you will have to schedule approximately 12 hours a week on your calendar/planner for this class, or 40 hours per week in a summer month long semester. Do that now: block out the hours.

This class will usually be taught in a 'flipped classroom' format. This means that there will be almost no lecturing in class (except much later in the course, mainly on classes some students may not have taken), just the students working problems at the board, etc. Indeed there is somewhat constant participation by all students. There is not time in class to teach again the contents of so many courses. Thus you will do the reading outside of class, with class time devoted to students working problems at the board, or in their seats doing tests. With regard to in-class presentations of problem solutions by students. the student will present at the board or computer projector, with the instructors help and advice if needed. For example you can ask the instructor any questions on

the material or problem beforehand, perhaps by email; try to not waste your fellow-students time by coming to the board unprepared. Your main task as a student in the in-class presentations, if you are not presenting, is to follow the presentations, and either (a) be reminded of the necessary technique to the point where you are confident that you could do a similar question on the upcoming test, or (b) if you fail on (a) then study the solution (from your notes taken in class or maybe from a photo of the presentation) after class on your own, until you do understand it and are confident that you could do a similar question on the upcoming test. You may need to consult notes or the internet, or come see the Instructor or TA in office hours, to get to that point. It is strongly suggested that all students look at and try the problems of the day before class, otherwise steps (a) or (b) will probably be more difficult. And of course you are supposed to already have studied the online notes on the module earlier. And in class when others are presenting be willing to share thoughts, feelings, and ideas, in the spirit of a flipped classroom! Some of the questions on some of the problem sheets are not for everybody (i.e. are a bit more challenging), and some are not likely to appear on the Field Test or Math GRE (remember our course also has a goal of honestly surveying many of the courses).

You may find the class structure complicated at first, but it will become clear as we get into it. Always ask, if you are not sure!!

On the existing class webpage "Notes for most of the modules" link there are pdf notes for the modules (as well as several optional prerecorded review lectures and filled out lecture pdfs (linked in the first rectangle on that webpage) which you should watch if you need to).

Note that this is the first time transitioning to the new platforms of Canvas and CCS, so there may be some teething problems.

Course delivery format:. This course is being offered as a face-to-face class. There will be a few study/lecture periods that will be taken online. Indeed for almost all classes you will not be able to join the class online by Teams or equivalent, the class will not be recorded, etc. Indeed you will see that this would be impossible with the flipped classroom method used.

This course is not self-paced; students are expected to follow the rather intensive summer class pace (most of the schedule is on the class calendar on Canvas, see also the the red flashing light area on the class website for upcoming assignments). Commit the assigned daily class time as a dedicated class time period, and put this on your weekly calendars. Attending every class is mandatory, but we also realize that there may be (rare) times that a student simply has to miss class. If you do have to miss a couple of days or more in a row we suggest that you take the class during another regular semester–summer classes are insane, as you no doubt know, and a couple of days in the summer is like a week and a half in a regular semester. Also, the class is not a 'lecture class'–YOU will present almost daily (either an actual presentation or a test or quiz), so as to give you maximum preparation for the standardized test at the end!

Academic Honesty Policy: High ethical standards are critical to the integrity of any institution, and bear directly on the ultimate value of conferred degrees. All UH community members are expected to contribute to an atmosphere of the highest possible ethical standards. Maintaining such an atmosphere requires that any instances of academic dishonesty be recognized and addressed. The UH Academic Honesty Policy (`https://uh.edu/provost/policies-resources/honesty/`) is designed to handle those instances with fairness to all parties involved: the students, the instructors, and the University itself. All students and faculty of the University of Houston are responsible for

being familiar with this policy.

In online assignments and tests you will sometimes be asked to make an Academic Honesty statement ("I received no help ...", etc.) It may be OK on certain kinds of assignments to use something you found on the internet, as long as you cite your link, come to a full understanding of it, and explain it in your own words. You are encouraged to work with others on homework or problems to be presented in class, form study groups, and so on, however copied turned in homework will not help you assimilate the material, and will not be graded. Any submitted work must be your own. So if you work in a group write up the solutions on your own in your own understanding, and not as a group. Posting answers for Quiz or Homework questions online (at group chats or other online tools) is considered an academic honesty violation. Students are expected to know the difference between "getting/giving HELP on a problem" and "getting/giving answers to a problem". If a student is caught sharing answers (in person or online), he/she might be reported to the departmental hearing officer for an academic honesty violation. If a student becomes aware of cheating or any other violations; that student is responsible for informing the instructor. Any substantive use of AI tools has to be acknowledged. Please bring your student ID, but no calculators, to tests and exams.

University of Houston students are expected to adhere to the UH Academic Honesty Policy (`http://catalog.uh.edu/content.php?catoid=36&navoid=13063` or google UH Academic Honesty Policy). "Academic dishonesty" means employing a method or technique or engaging in conduct in an academic endeavor that contravenes the standards of ethical integrity expected at the University of Houston or by a course instructor to fulfill any and all academic requirements. Academic dishonesty includes, but is not limited to, the following: Plagiarism; Cheating and Unauthorized Group Work; Fabrication, Falsification, and Misrepresentation; Stealing and Abuse of Academic Materials; Complicity in Academic Dishonesty; Academic Misconduct. Refer to UH Academic Honesty website (`http://www.uh.edu/provost/policies/honesty/`) and the UH Student Catalog for the definition of these terms and university's policy on Academic Dishonesty. Anyone caught cheating will be reported to the department for further disciplinary actions, receive sanctions as explained on these documents, and will have an academic dishonesty record at the Provosts office. The sanctions for confirmed violations of this policy shall be commensurate with the nature of the offense and with the record of the student regarding any previous infractions. Sanctions may include, but are not limited to: a lowered grade, failure on the examination or assignment in question, failure in the course, probation, suspension, or expulsion from the University of Houston, or a combination of these. Students may not receive a W for courses in which they have been found in violation of the Academic Honesty Policy. If a W is received prior to a finding of policy violation, the student will become liable for the Academic Honesty penalty, including F grades.

Artificial Intelligence: Students are required to disclose when they use AI tools, to maintain integrity. You must not use AI-based tools to cheat on online assessments. Do not turn in AI generated work, and this includes your presentation pdf's. Any turned in work must be written in your own words and understanding. Often you may use AI and online sources as an aid, but it needs to have been fully understood and internally processed. Pasting into turned in work from an AI source without proper understanding and sufficient processing, constitutes a breach of part of the UH Academic Honesty Policy, and may be treated as an academic honesty violation. If any part of this is confusing or uncertain, please reach out to me for a conversation before submitting your work. Often reliance on AI means that important things are left to the last minute, done in a hurried manner, without being truly processed or fully understood. Sadly, it's the processing time that you cannot short-cut: you need to truly digest and synthesize what it is you're trying to learn. This is especially important in this course since you don't want to shoot yourself in the foot: so

much of the grade is based on the proctored Final Exam, and the assignments are in large part there to prepare you for this. You also need to be able to discern reliable from unreliable sources.
The materials provided by the instructor in this course are for the use of the students enrolled in the course only. Copyrighted course materials may not be further disseminated without instructor permission. This includes sharing content to commercial course material suppliers such as Course Hero or Chegg. Students are also prohibited from sharing materials derived from the instructor's content (e.g., a student's lecture notes). Sharing homework, quiz or test problems with commercial course material suppliers is a violation of copyrights.

Communication and feedback: Communication between you and the instructor is by email to your official UH email address, and by postings by the red flashing light on the class website, etc. There may also be announcements via Canvas or Teams. Instructor will not respond to Teams chat messages or video calls outside of class and of office hours. Please be sure that you are regularly getting and seeing your email to your official UH email address, since the instructor will largely communicate with the class by email like this. Emails from me seem to come both from dpbleche... and dblecher... so look for both. UH policy states that all required written notices shall be addressed to the student via their UH email. Notices properly addressed and so sent shall be presumed to have been received by the student. Thus, you are responsible for the content in emails sent to your UH account, regardless if your external (non-UH) email provider filters or blocks them. Emails lost to external providers shall not be used as a justification to claim faculty are unresponsive, to appeal grades, etc.

Bring comments or complaints to my attention as soon as possible. Don't wait until the end of the semester to bring up a matter which we could deal with and solve early on.

Help/Tutoring: Help is available at several levels. The TA/graders can answer questions and go over problems. They and your instructor will have office hours (listed on the Course Handout) and help is available there as well. See also the list at the bottom of the main course webpage of sources for **tutoring/workshops/online help,** etc. See also
`http://www.uh.edu/nsm/math/undergraduate/academic-assistance/Support-and-Tutoring/`

Course grade: This may change: is based on a score between **830-930 points** (depending on the number of tests) consisting of:

- **100 points** for homework and quizzes (there will be some weekly homework to be turned in on Canvas, some EMCF quizzes on CCS/CASA, some pop quizzes in class). You can find your EMCF grades in the lgc tab on CCS/CASA. The lowest homework and quiz grades will be effectively dropped (since e.g. the EMCF 'total' is taken to be significantly less than the possible total).
- **50 points** for each of 7 in-class tests (except for 30 points for the test on Calculus I material) and written solutions to the problem sheets worked in class.
- **100 points** for in-class presentations and problem sheet writeups (most of the 70 points are for your presentations). (A large part of this score is based on how often you present; people doing very few presentations will get a very low grade. We expect everybody to be doing approximately the same number of presentations. Generally your presentation is given 0, 5 or 10 points–0 for a 'no-show', and 5 if you present but there are significant errors or issues with the presentation. You can eliminate significant errors by uploading your presentation as a pdf 24 hours in advance (if possible) to the folder on Canvas for that module, and

sending me a copy by email, and by emailing me 24 hours in advance if possible if you wish to discuss it).

- **40 participation points**, for in class participation including attendance. You are expected to speak at least once every class (1 point each, max total 20), and you will lose 2 points for each nonattendance (total 20).
- **350 points** for your grade on the Major Field Test (so just less than 40 % of the course grade). If you do not take or pass the Field Test you cannot pass the class. Moreover, you are not eligible for an A unless you score at or above the national median on the Field Test. Since the Field test is radically scaled up (so that 0 % becomes 60 %, for example, see `https://www.ets.org/mft/scores/`), thus we will scale it down linearly so that 60 % becomes approx 30 % for example, so that effectively 0 % is becoming 30 % and so on).

The instructor may change the grade distribution above at his discretion. Note that the grade sheet on Canvas is clunky and serves simply as a repository of your grades so far–ignore the final column giving you a symbol estimate, that is very inaccurate. The final grade sheet for the course is produced after the Field Test grades come in at the end of the semester. It is produced from the one on Canvas, but is different and has several extra columns, entries, and any and all computations/curve etc. The formulae used to compute the final semester percentage follow the Course grade distribution/rubric above. If you are interested, you may obtain a copy from the instructor of the grade cutoff points for A, A-, etc. from a previous semester, although this changes fractionally every semester based on the curve.

This may change: Although you are required to turn in some few written solutions to all of the problem sheets worked at the board in class, not everybody needs to turn in all of them. The rule is: you can opt out of turning in all of these written solutions if you score higher than 50 % on the corresponding test (or 60 % on a 'take-home test'). If you score less than this you are required to turn in the solutions to the problems worked in class in the present or the next module (or at least most of them). The instructor will inform you of which. These written solutions need to be in your own words (evidence of word for word copying in any problem will lead to the assignment not being collected and getting 0; otherwise they will be graded mostly for completeness). If you are asked to turn in all of the solutions then the grade will be averaged in to your test score in some proportion so that they will improve your grade on that test. These writeups will not be returned to you so please keep a copy.

Instructions for presentations:

Instructions for writing your presentations on the board: Begin by writing your initials and the problem number and a statement of the problem you are presenting. Write big! And neatly and legibly (and dark enough, and not blurred), or type. Draw a picture(s) if possible. It would help others if you highlight the key point/formula or two in your solution, and the final answer, by putting them in a box. For example, if its a 'plug and chug' into a formula, say so and point at that formula in the box. Send me your solution 24 hours before the class you will be presenting in, by email and as an upload to Canvas as a pdf, to the link found in the folder on Canvas for the module we are working on. Keep a copy for your records. I will check your solution for errors, and may make some suggestions before the class.

And in class when others are presenting... be willing to share thoughts, feelings, and ideas, in the spirit of a flipped classroom!

In the case that the assigned presenter has to miss class at the last moment for a valid documented reason, you may be able to do your presentation the next day, or if not please ask another person or the instructor to present (but do be sure to send the pdf of the solution to me earlier as usual). If this does not happen and there is no presenter of a particular problem and no pdf of the solution sent to

the instructor in advance, then that person will lose those presentation points. The instructor will keep a list of those who present; students not presenting problems regularly will lose all presentation points at the end of the semester (unless there is a medical reason, etc).

(If the class is divided into groups for presentations–this probably wont happen–please contact your groupmates, and arrange for an efficient communications method (eg. groupme). Please elect a group leader. Decide among your group who is going to present what number: for example, volunteer early for the problems you like better. We suggest that the presenter sends their solution to their group before class for the group to check that it is correct and clear. In the case that the assigned presenter has to miss class at the last moment please ask another person in the group to present.

Class calendar: is on Canvas, and upcoming assignments may be found by the red flashing light on the class website.

Attendance and late assignments: Attendance is mandatory, but we also realize that there may be times some of you simply have to miss class. If you miss class you will probably get an email of enquiry from the instructor–this is partly your record that your absence was noted. Students will be dropped for excessive absences. Thus students with excessive absences from the classroom before the ORD date will be dropped. For example, there are almost weekly tests, daily presentations, quizzes and pop quizzes, i.e. somewhat constant participation by the student, etc. Do not take this class if you know that you will have to miss class more than seldom. If you do miss with a valid excuse such as doctors note etc, you can do your presentation to me at another time, or do the quiz as an oral exam, etc.

Students are expected to check the calendar on Canvas and the red flashing light on the class website every day, and plan ahead so that they don't miss assignments. Students should not expect to have an option to make up missed assignments or tests unless in the case of an excused absence (See: Excused Absence Policy below). If requesting make up work (assignment or test) due to an excused absence: the student needs to contact the instructor in writing before the next class meeting (or as soon as possible afterwards with an explanation regarding why the notice could not be sent before the next class meeting). There will be no makeup tests at all for in-class tests right at the end of the course (for reasons explained then; and we will deal with such a different way). Read the Undergraduate Excused Absence Policy to see a list of documentations (doctors note or the like/an acceptable documented excuse or university approved absence) to support your request; follow the guidelines provided on this document to make your request. Your instructor will inform you of the decision in writing (via email). These rules do not apply to Test 1.

Homework: You will be asked to turn in several homework problems every week, sometimes even every day.

Tests and Test policies: There will be quizzes during class time, and many tests during class time. Tests will be taken in the classroom but (many of the tests are spread over two class periods since it is hard to test on a whole course in 50 minutes). Corrections to grading errors should be brought to my attention in a timely manner. Some of these tests are effectively take-home quizzes.

A makeup test, if approved (see above) will probably not be the same test, and it might be an oral examination. It will not be online, as per departmental policy.

Final exam: Instead of an in-house final you will be required to take the Major Field Test in Mathematics. This is a national standardized test administered by ETS, and facilitated by the University Testing Center. You can find information on this linked elsewhere on the course webpage). It is impossible to 'fail' the Major Field Test if one takes it, but you cannot get an A or A- in the course unless you score above the national median. There is a fee (around $50, if we include the ETS online proctoring fee, it is less if we do not have to do that and if we can use the UH testing center) for taking the Major Field Test, which you pay when registering for it with the University Testing Service. Hopefully this expense is defrayed by not having to purchase a text book for the course. This is a national standardized test which we do not host, so if you pay for the test but miss the testing appointment for any reason, you may well have to pay again for the test and ETS proctoring (unless you are somehow able to get ETS to waive part of the cost, or move your dates without much penalty). Some of the questions on some of this exam are not for everybody. The test itself is a race against time; and you should train yourself at guessing intelligently/eliminating choices in the multiple-choice. The questions on the Major Field Test look quite similar to those on our EMCF's. Fortunately grades on the Major Field Test which fall in the top 10 percent in the nation are rounded up by the organization that produces it to 100 % (even if plenty of mistakes are made!) The Field Test will be taken in the last few days or so of class –watch the main page for the course for details when those are available. If for some reason taking the field test is impossible (it is hard to imagine what such a reason might be), an alternative final may be given (perhaps an oral exam), but it would be worth much much less than the points mentioned above (perhaps 200 points).

Incompletes: only given to students passing the class on the work during the semester, who are unable to take the Final for unforseeable, unpreventable, documented circumstances.

Excused Absence Policy: See Syllabus page at `https://uh.simplesyllabus.com/en-US/doc/17tf2bdyr/Summer-2025-MATH-4389-14595-Survey-of-Undergraduate-Mathematics?mode=view`

As per the Excused Absence Policy linked there, "Excused absences under this policy may be granted for a maximum percentage of coursework as determined by the instructor in each class, typically 15 % [of the semester work not including the final exam]... Faculty also have the option to drop students for excessive absences until the official closing date of the term".

Syllabus Changes: Due to the changing nature of the COVID-19 pandemic or other events, please note that the instructor may need to make modifications to the course syllabus and may do so at any time. Notice of such changes will be announced as quickly as possible through the course website and posted syllabi etc, Canvas, or announced in class or possibly by email.

Recording of Class: See Syllabus page at `https://uh.simplesyllabus.com/en-US/doc/17tf2bdyr/Summer-2025-MATH-4389-14595-Survey-of-Undergraduate-Mathematics?mode=view`

Reasonable Academic Adjustments/Auxiliary Aids : See Syllabus page at `https://uh.simplesyllabus.com/en-US/doc/17tf2bdyr/Summer-2025-MATH-4389-14595-Survey-of-Undergraduate mode=view`

Women and Gender Resource Center: See Syllabus page at `https://uh.simplesyllabus.com/en-US/doc/17tf2bdyr/Summer-2025-MATH-4389-14595-Survey-of-Undergraduate-Mathematics?`

mode=view

Title IX/Sexual Misconduct: See Syllabus page at https://uh.simplesyllabus.com/en-US/doc/17tf2bdyr/Summer-2025-MATH-4389-14595-Survey-of-Undergraduate-Mathematics?mode=view

Mental Health and Wellness Resources: See Syllabus page at https://uh.simplesyllabus.com/en-US/doc/17tf2bdyr/Summer-2025-MATH-4389-14595-Survey-of-Undergraduate-Mathematics?mode=view