

Math 220 Multivariable Calculus Syllabus
Agnes Scott College, Fall 2020
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The class is online, through Canvas. If you have any technology issues (wifi, Zoom, Canvas, etc.), just let me know and we'll figure out something that will work for you.

All times are Atlanta (US Eastern) time zone.

Office hours: Mon 2:30-3:30, Tues 10:00-11:30, and by appointment. On Zoom - links on Canvas.

Required material: McCallum, Hughes-Hallett, Gleason, et al., Multivariable Calculus, 5th ed.

Class structure: (Details and links on Canvas.) We'll be using a flipped classroom approach, in which students study the material (textbook and videos) outside of class, and we meet (on Zoom) to discuss concepts, questions, and example problems. After the first day of class, **we will meet on Zoom once weekly, on Mondays, 11:00-11:50 - make sure that you're ready to discuss the assigned material each week.** (Zoom class meetings will be recorded. To preserve the integrity of the classroom experience and to protect students' privacy, which we are legally required to do, only students registered in the course may attend a Zoom class meeting.) There will also be online discussion on Canvas - each week, you are required to post at least one comment, and respond to another student's comment.

Plan: We'll cover most of chapters 12-17. There's a more detailed schedule below, but it's subject to change.

Homework: By now you've probably figured out that working problems is mostly how you learn math. There will be homework assigned nearly every week, due at midnight on Wednesdays. I strongly encourage you to work in groups, but you must make sure that you understand the problem completely yourself before submitting your answer. You will turn in some of each assignment on Webwork, which you can access through Canvas. You can submit answers as many times as necessary on Webwork (up to the due date), so I expect that you'll get 100% on each assignment. Some of the assignments you do not need to turn in, but you are responsible for the material - completing only the Webwork assignments is not enough to prepare you for the exams. Math 220 is a 4-credit course. In addition to in-class time, you will be spending time outside of class on various activities. The first and most important activity is to regularly read the text and to work through and understand the examples in each section. You should try to spend time on this every day.

Proficiency tests: You will need to pass two tests on multivariable calculus proficiency skills on Webwork, one on partial differentiation (chapter 14 material), and the other on multiple integration (chapter 16 material). Each will consist of a small number of problems, and you must get all of them correct. Each test is 5% of your final grade, and no partial credit will be given. You may retake the proficiency tests (with different problems) as many times as necessary. These must be completed by hand without help from any technology, websites, or other people.

Honor code and group work: All students are expected to follow the honor code throughout the semester; all exams and assignments should be pledged.

I strongly encourage you to work on the homework in groups. I suggest that you work on the problems by yourself first, making a note of anything giving you trouble; then meet with your group and work through the remaining problems together; and finally submit the solutions by yourself. Every group member must submit her own solutions independently; just copying the group's answers is plagiarism and is unacceptable.

Getting help: Chances are that sooner or later you'll get stuck on something, so don't get frustrated. Think hard, and if you're still stuck, do something else for a while. (It's amazing how often that works.)

My office hours are above - these are times when I'm guaranteed to be sitting around on Zoom waiting to talk to someone. If you want to see me at other times, please let me know and we'll find a time.

Student learning assistants in the Math Learning Center will be able to provide help throughout the week. More details, including the schedule, will be posted on Canvas. You are encouraged to use this service, and should think of it as part of your weekly mathematics regimen.

Finally, I can't emphasize enough that your classmates are your best source of help.

Course goals:

Learn the tools and techniques of multivariable calculus, and their application in both mathematical and scientific contexts

Understand the development of differentiation and integration of functions of several variables

Develop an intuition for the geometry and properties of curves and surfaces

Enhance your analytic (problem solving) skills, your ability to think abstractly and to analyze critically, and your computational (algebraic) skills

Be able to use computer software as a computational tool for understanding and solving problems in multivariable calculus and its applications

Learn to communicate mathematics effectively, both orally and in writing

Exams: We will have three midterm exams and one final exam, all closed-book. The first midterm covers all material up to that point, the second covers all material since the first, the third covers all material since the second, and the final is cumulative. The midterms will be available on Canvas between 8 am and 10 pm on their scheduled day; you will download a PDF of the exam, write solutions on your own paper, then scan and upload your solutions. You will have 90 minutes to upload your solutions, starting when you access the exam.

Assessment: Each midterm 10%, each proficiency test 5%, homework 25%, weekly discussion participation 10%, final exam 25%.

Late work: Late work won't be accepted, and you won't be allowed to make up missed exams, except under very exceptional circumstances (e.g., the sasquatch attacks - and even then you should get a note from the sasquatch). In the case of a conflict that you absolutely can't resolve (for example, a religious holiday), you may arrange to take a midterm exam early.

Attendance and participation: I expect you to be at Zoom class meeting, on time, unless you've talked to me about having to be absent for technological or other reasons. However, tardiness or absence will have no (direct) effect on your grade. Participation in the weekly discussions on Canvas is required,

Dates and deadlines:

First midterm exam: Fri., 9/11.

Second midterm exam: Wed., 10/7

Partial differentiation proficiency test: due Fri., 10/16.

Third midterm exam: Fri., 10/30

Multiple integration proficiency test: due Fri., 11/20.

Final exam: self-scheduled.

Week 1: 8/21	Introduction, 12.1
Week 2: 8/24-8/28	Visualization, linear functions, 12.4-12.4
Week 3: 8/31-9/4	Vectors, 13.1-4
Week 4: 9/9-9/11	First midterm , 9/11
Week 5: 9/14-9/18	Partial derivatives, 14.1-3
Week 6: 9/21-9/25	Gradients, directional derivatives, 14.4-5
Week 7: 9/28-10/2	Chain rule, 2nd derivatives, 14.6-7
Week 8: 10/5-10/7	Second midterm , 10/7
Week 9: 10/12-10/16	Local extrema, 15.1-2 Partial differentiation proficiency test due (online), 10/16
Week 10: 10/19-10/23	Lagrange multipliers, 15.3
Week 11: 10/26-10/30	Third midterm , 10/30
Week 12: 11/2-11/6	Double integrals, 16.1-2
Week 13: 11/9-11/13	Triple integrals, polar/cylindrical/spherical coordinates, 16.3-5
Week 14: 11/16-11/20	Probability, parametrized curves, 16.6, 17.1-2 Multiple integration proficiency test due (online), 11/20
Week 15: 11/23	Summary/review
12/2-7	Final exam

Course evaluation: Your feedback on the course is extremely valuable to me, the math department, and the administration. In particular, I take your comments very seriously and use them to improve the course the next time I teach it. You are responsible for completing an evaluation of the course at the end of the semester.

Title IX: For the safety of the entire community, any incidence of or information about sexual misconduct must be reported immediately to Title IX Coordinator Marti Fessenden (mfessenden@agnesscott.edu, 404-471-6547) or Deputy Title IX Coordinator Karen Gilbert (kgilbert@agnesscott.edu, 404-471-6435).

Inclusion: This course adheres to the principles of diversity and inclusion integral to the Agnes Scott community. We respect people from all backgrounds and affirm people's decisions about gender expression and identity. Please let me know your preferred name or gender pronoun if different from the class roster. The Gay Johnson McDougall Center for Global Diversity and Inclusion is centered and grounded in dismantling systems of oppression, including structural

and systemic racism, as well as empowering each individual to take action that uplifts and builds community. Students can contact them at diversity@agnesscott.edu or 404.471.6118.

ADA: Agnes Scott College seeks to provide equal access to its programs, services and activities for people with various abilities. If you will need accommodations in this class, please contact the Office of Academic Advising and Accessible Education (404-471-6150) to complete the registration process. Once registered, please contact me so we can discuss the specific accommodations needed for this course.