

SYLLABUS

MTH 212 – Multivariate Calculus, Sections A and B – Spring 2022

Instructor: Dr. Sofya Chepushtanova

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- Class webpage:
<https://chepusht.mathcs.wilkes.edu/multivariate-calculus-spring2022.html>

Meeting Times:

- **Section A:** MWRF 01:00-01:50 pm in SLC 424.
- **Section B:** MWRF 03:00-03:50 pm in SLC 424.

Office Hours: W 12:00-12:50 pm and MWRF 02:00-02:50 pm or by appointment.

Course Description and Objectives: Differential and integral calculus of real and vector valued functions. Topics include vectors, vector-valued functions, functions of several variables, limits, continuity, partial differentiation, implicit functions, gradient, curl, line, surface, and multiple integrals, vector fields, theorems of Green and Stokes. Students successfully completing this course should be able to:

- Understand lines and planes in 3-space.
- Work with polar, spherical and cylindrical coordinates.
- Classify conic sections and quadric surfaces.
- Do vector computations in two and three dimensions, including dot products, cross products and triple products.
- Compute limits, derivatives and integrals of vector-valued functions, tangents and normals to curves, and curvature.
- Compute partial derivatives, directional derivatives, gradients and find extreme values of functions of several variables.
- Use Lagrange Multipliers to find extreme values subject to constraints.
- Compute double and triple integrals in various coordinate systems.
- Work with parameterized surfaces.
- Work with vector fields and compute divergence and curl.
- Compute line integrals and surface integrals using Green's Theorem, Stokes' Theorem and the Divergence Theorem.

Prerequisites: MTH 112 or its equivalence *with a grade 2.0 or better*.

Textbook: (1) University Calculus, Early Transcendentals, **4th ed.**, by Hass, Heil, Weir, Thomas, and Bogacki; Pearson; paperback ISBN-13: 9780134995540.

(2) *As an option*, you can use University Calculus, Early Transcendentals, Multivariable Calculus, **4th ed.**, Hass, Heil, Weir, Thomas, and Bogacki; Pearson; chapters 9-17 only - ISBN-13: 9780135165119.

(3) Another option is if you still have access to MyLab Math from your previous math courses,

you can use an electronic version of the textbook available online. Contact me if you need sign-up instructions.

COVID-19 Safety Rules: *Always wear a mask. Wash your hands or use hand sanitizer. Sanitize your desk before class. Use the same seat in the classroom (for contact tracing purposes). No eating or drinking allowed in the classroom (bottled water only). If you are sick, stay at home, and let me and the university health services know.*

Attendance: You are required to attend all classes, unless you are sick. You are responsible for everything that goes on in class (even if you are not there). Roll will be taken at each class. I will adhere to the Wilkes University Policy regarding class attendance policies (see the Wilkes Student Handbook). In particular, after 5 consecutive instructional hours of unexcused absences from a class, students may be readmitted to the class only by action of the Office of Student Affairs and the department chairperson concerned. *Remember that poor attendance is a major contributor to poor performance!*

Calculators and Software: *NO calculators will be allowed (or needed) on exams.* Computer access is needed for *WeBWorK* and *Mathematica*. **For all official communications I will use your Wilkes University email account. Check it regularly.**

Exams¹, Homework, and Projects: There will be 4 (four) in-class midterm exams. I will drop the lowest exam score. Note that **no makeups will be given for exams, if you miss an exam it will be the one you drop.** If classes are canceled or put on a compressed schedule due to the weather on an exam day, the exam will be given at the next regular class.

There will be a cumulative final exam, given during finals week.

There will be weekly *WeBWorK* homework assignments and several *Mathematica* projects during the semester following the schedule shown on our web page. I will drop two lowest homework scores and one lowest project score. Note that **homework and projects will not be accepted late.**

It is important to keep up with the homework and projects – completing them will help you understand the issues that come up in class. If you have any questions, use my office hours to get help. There are also *suggested exercises (not graded)* that you are encouraged to do for additional practice and understanding the material. A list of assignments, projects, and suggested exercises can be found on our web page. It will be updated as the semester progresses.

Grading: Your grade in this course is calculated from the following components:

ITEM	Percentage
<i>WeBWorK</i> assignments	10%
<i>Mathematica</i> projects	10%
3 Best midterm exams	50%
Final Exam	30%

¹Note: if we continue in the remote format, you will have to use a webcam on your computer to allow exam proctoring via LIVE's respondus monitor and lockdown browser.

and your final grade will be assigned from the total percentage you earn as follows:

Raw Score	0 to 59%	60 to 64%	65 to 69%	70 to 74%	75 to 79%	80 to 84%	85 to 89%	90 to 100%
Grade	0	1.0	1.5	2.0	2.5	3.0	3.5	4.0

However, there is an additional restriction for a failing grade on the final exam: if a student does not score at least 50% on the final, the highest grade they are eligible for is a 1.5.

Expectations: In addition to good attendance, you should plan to study 2-3 hours outside of class for each hour in class. So, for our 4-hour class, this means you should spend 8-12 hours per week *studying outside of class*. You are expected to *read the textbook for comprehension*. It gives a detailed account of the material of the course. *It is your responsibility to learn the material*. The instructor's job is primarily to provide a framework, to guide you in doing your learning of the concepts and methods that comprise the course. If you are experiencing difficulty, go to your instructor's office hours for extra help. Form a study group of classmates who are also committed to mastering multivariate calculus.

Please note that all students have the same opportunity in this class, so I cannot provide you (or a subset of the students) with extra credit assignments. Work hard and earn the grade you want!

Drop Policy: If you wish to drop from the course, I will give my permission during the first ten weeks of the semester. Thereafter you will need the permission of the Dean. Be aware that poor performance in the course will not be a sufficient reason for the Dean's permission to be granted.

Academic Honesty: By submitting your assignments, projects, and exams you certify that this is **your own work**. If there is evidence that work you hand in is not your own, the first time you will receive a zero on the exam and the second time you will receive a grade of 0 in the course. Appropriate deans will also be notified. **Put simply: do not cheat. I have no patience for academic dishonesty.**

Cell Phones should be switched to silent mode (or turned off), and put out of sight during class time. **NOTE: THE USE OF CELL PHONES DURING EXAMS IS EXPRESSLY FORBIDDEN AND WILL RESULT IN A GRADE OF 0.**

Email Etiquette: Please refer to the following tutorial on how to communicate with your instructor via email: <https://marktomforde.com/academic/undergraduates/Email-Etiquette.html>. View an email to a professor as a professional interaction. How you choose to interact conveys your level of seriousness and professionalism.

Next page: tentative schedule of sections and assignments

Good luck this semester!

Tentative Schedule of Sections and Assignments for MTH 212, Spring 2022

Week	Monday	Wednesday	Thursday	Friday
1/17	<i>MLK Day</i>	Syllabus, §11.1	§11.1	§11.2 WeBWorK Orient.
1/24	§11.2	§11.3	§11.3	§11.4 WeBWorK1
1/31	§11.4, 11.5	§11.5	§11.6, A4	§12.1 WeBWorK2
2/7	§12.1, 12.2	§12.3 Math. Project 1	§12.4	Exam I WeBWorK3
2/14	§12.5	§10.3	§10.4, 10.5	§13.1 WeBWorK4
2/21	§13.1, 13.2	§13.2 Math. Project 2	§13.3	§13.4 WeBWorK5
2/28	§13.4, 13.5	§13.5	§13.6	§13.7 WeBWorK6
3/7	<i>Spring Recess</i>			
3/14	§13.7, 13.8	§13.8 Math. Project 3	§14.1	Exam II WeBWorK7
3/21	§14.2	§14.2, 14.3	§14.4	§14.5 WeBWorK8
3/28	§14.5, 14.6	§14.7 Math. Project 4	14.7	§14.8 WeBWorK9
4/4	§14.8	§15.1	§15.1	Exam III WeBWorK10
4/11	§15.2	§15.2 Math. Project 5	<i>Holiday Recess</i> WeBWorK11	
4/18	§15.3	§15.4	§15.4, 15.5	§15.5 WeBWorK12
4/25	§15.6	§15.6 Math. Project 6	§15.7	Catchup/Review WeBWorK13
5/2	Monday: Exam IV We have class on 5/3: Tuesday follows Thursday schedule! §15.8	Catchup/Review Wednesday follows Friday schedule	Final Examinations start WeBWorK14	

NOTE: Suggested practice problems from the textbook are given on the class web page <https://chepusht.mathcs.wilkes.edu/multivariate-calculus-spring2022.html>