

SYLLABUS

MTH 212 – Multivariate Calculus, Sections A and B – Spring 2020

Instructor: Dr. Sofya Chepushtanova

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- Class webpage: <http://chepusht.mathcs.wilkes.edu/multivariate-calculus-spring2020>

Class Meetings:

- **Section A:** M, 01:00-01:50 pm in SLC 409 and WRF, 01:00-01:50pm in SLC 424.
- **Section B:** M, 03:00-03:50 pm in SLC 409 and WRF, 03:00-03:50pm in SLC 411.

Office Hours: MWF 09:00-09:50 am and 2:00-2:50 pm or by appointment, SLC 410.

Course Description and Objectives: Differential and integral calculus of real and vector valued functions. Topics include vectors, vector-valued functions, 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 and rotate polar, spherical and cylindrical coordinates.
- Classify and graph conic sections.
- 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: University Calculus, Early Transcendentals, **3rd ed.**, by Hass, Weir, Thomas; Pearson Addison Wesley 2015; ISBN 978-0321999580 (hardbound full text).

As an option, you can use University Calculus, Early Transcendentals, Multivariable Calculus, 3rd ed., by Hass, Weir, Thomas; Pearson Addison Wesley 2015; ISBN 978-0321999603 (Chapters 9-17 only).

Another option is if you still have an access to MyLab Math from previous math courses, you can use an electronic version of the textbook available online. (NOTE that you DO NOT have to have an access to MyLab Math, unless you want to use the e-text.)

Attendance: You are expected to attend all classes. 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: You may want a calculator to help with homework, but *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.

Exams, Homework, and Computer Projects: There will be 4 (four) in-class exams (tentatively scheduled for 2/7, 3/13, 4/3, 4/27), the best three of which together will count for 1/2 of your grade. 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, which will count for (about) 1/3 of your grade.

There will be up to 13 (thirteen) *WeBWorK* homework assignments and up to 6 (six) *Mathematica* projects during the semester following the schedule shown on our web page. The best 10 (ten) *WeBWorK* assignments and the average of the best 5 (five) *Mathematica* projects together will count for 1/5 of your grade. Note that **homework and projects will not be accepted late.** You need to keep up with the homework – completing the homework will help you understand the issues that come up in class. If you have any questions, you should see me outside of class during my office hours to get help. There are also *suggested exercises (not graded)* that you are encouraged to do for 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 | Max. Pts. |
|---|-----------|
| 10 best <i>WeBWorK</i> grades (6 pts each) | 60 |
| Average of 5 best <i>Mathematica</i> projects | 60 |
| 3 best exams (100pts each) | 300 |
| Final Exam | 180 |
| TOTAL | 600 |

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

| | | | | | | | | |
|------------------|----------|------------|------------|------------|------------|------------|------------|------------|
| Raw Score | 0 to 359 | 360 to 389 | 390 to 419 | 420 to 449 | 450 to 479 | 480 to 509 | 510 to 539 | 540 to 600 |
| 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 (for instance, 90 points out of 180 total), 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 handing in 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://www.math.uh.edu/~tomforde/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 2020 (Dates are Subject to Change)**

| Week of | Monday | Wednesday | Thursday | Friday |
|---------|-----------------------|-------------------------------------|-----------------------------------|------------------------------------|
| Jan 12 | Syllabus, lab, §11.1 | §11.1, 11.2 | §11.2 | §11.3 |
| Jan 19 | <i>MLK Day</i> | §11.3, 11.4 WeBWorK Orient. | §11.4 | §11.5 WeBWorK1 |
| Jan 26 | §11.5, lab | A4, §11.6 Math. Project I | §12.1 (also §10.1) | §12.2, 12.3 WeBWorK2 |
| Feb 2 | §12.4, lab | §12.5 | Catch-up/Review | Exam I (2/7) WeBWorK3 |
| Feb 9 | §10.3, lab | §12.6 Math. Project II | §13.1 | §13.1, 13.2 WeBWorK4 |
| Feb 16 | §13.2, lab | §13.3 | §13.4 | §13.5 WeBWorK5 |
| Feb 23 | §13.5, lab | §13.6 Math. Project III | §13.7 | §13.8 WeBWorK6 |
| Mar 1 | <i>Spring Break</i> | | | |
| Mar 8 | §14.1, lab | §14.2 | Catch-up/Review | Exam II (3/13) WeBWorK7 |
| Mar 15 | §14.3, 14.4, lab | §14.4 Math. Project IV | §14.5 | §14.5, 14.6 WeBWorK8 |
| Mar 22 | §14.7, lab | §14.7 | §14.8 | §15.1 WeBWorK9 |
| Mar 29 | §15.2, lab | §15.2, 15.3 Math. Project V | Catch-up/Review | Exam III (4/3) WeBWorK10 |
| Apr 5 | §15.3, lab | §15.4 | <i>No classes: Holiday Recess</i> | |
| Apr 12 | §15.4, lab | §15.5 | §15.5, 15.6 | §15.6 WeBWorK11 |
| Apr 19 | §15.7, lab | §15.7 Math. Project VI | §15.8 | Catch-up/Review WeBWorK12 |
| Apr 26 | Exam IV (4/27) | Tuesday: §15.8 Wednesday: Review | <i>Final Exams</i> | WeBWorK13 |

*NOTE: Suggested practice problems from the textbook are given on the class web page
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