

University of Delaware
Department of Mathematical Sciences
MATH-243 – Analytical Geometry and Calculus C
Section 51 – Fall 2013

Instructor: Dr. Marco A. MONTES DE OCA (yes, I have a three-word last name!)
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Office hours: Monday and Wednesday 4:00pm–6:00pm or by appointment
Lectures: Tuesday and Thursday 7:00pm–9:00pm, 106 McDowell Hall

1 About Your Instructor

I work at the Department of Mathematical Sciences as a postdoctoral researcher. I moved to the U.S. in August 2011 after earning my Ph.D. at the artificial intelligence laboratory (IRIDIA) at the *Université libre de Bruxelles* (the French-speaking Free University of Brussels), Brussels, Belgium. Before that, I studied and worked in Mexico.

My research is aimed at understanding how and under which circumstances, large groups of agents (animals, humans, or machines) collectively solve problems that no single agent could if it acted alone. For example, ant colonies can find the shortest path between their nest and a food source, yet ants in isolation move pretty much randomly. This phenomenon is called *swarm intelligence*. There are artificial swarm intelligence methods that have applications in the field of optimization, which we will discuss by the beginning of October.

Traveling is one of my favorite activities. I like traveling partly because I agree with what George Santayana wrote in “The Philosophy of Travel”: *There is wisdom in turning as often as possible from the familiar to the unfamiliar: it keeps the mind nimble, it kills prejudice, and it fosters humour.*

2 About the course

This course deals with the extension of the basic ideas of calculus to problems that involve two, three, and in some cases more variables.

The textbook used in this course is “Calculus 241/242/243- Calculus Early Transcendentals”, by James Stewart, 7th edition, University of Delaware Edition, Loose-Leaf version with Enhanced Web Assign, UDel Customized Book + Enhanced WebAssign = ISBN 9781285255415.

You may use earlier editions of the textbook. However, you will also need WebAssign access (it can be purchased separately) because that will give you access to the electronic format of the latest edition of the textbook and all the homeworks will be assigned and graded through this system.

The chapters of the textbook this course is based on are: 12, 13, 14, 15 (except 15.5 and 15.10), and 16. In particular, we will study:

Topic(s)	Book Section	Tentatively covered by	Exam
3D coordinate systems	12.1	Week 1	1st Midterm
Vectors	12.2	Week 1	
The dot product	12.3	Week 1	
The cross product	12.4	Week 1	
Equations of lines and planes	12.5	Week 1	
Cylinders and quadratic surfaces	12.6	Week 2	
Vector functions and space curves	13.1	Week 2	
Derivatives and integrals of vector functions	13.2	Week 2	
Arc length and curvature	13.3	Week 3	
Motion in space	13.4	Week 3	
Functions of several variables	14.1	Week 4	
Limits and continuity	14.2	Week 4	
Partial derivatives	14.3	Week 4	
Tangent planes and linear approximations	14.4	Week 5	
The chain rule	14.5	Week 5	2nd Midterm
Directional derivatives and the gradient vector	14.6	Week 6	
Maximum and minimum values	14.7	Week 6	
Lagrange multipliers	14.8	Week 6	
Double integrals over rectangles	15.1	Week 7	
Iterated integrals	15.2	Week 7	
Double integrals over general regions	15.3	Week 7	
Double integrals in polar coordinates	15.4	Week 9	
Surface area	15.6	Week 9	
Triple integrals	15.7	Week 10	
Triple integrals in cylindrical coordinates	15.8	Week 10	Final Exam*
Triple integrals in spherical coordinates	15.9	Week 10	
Vector fields	16.1	Week 11	
Line integrals	16.2	Week 11	
The fundamental theorem for line integrals	16.3	Week 12	
Green's theorem	16.4	Week 12	
Curl and divergence	16.5	Week 13	
Parametric surfaces and their areas	16.6	Week 13	
Surface integrals	16.7	Week 14	
Stoke's and divergence theorem	16.8 & 16.9	Week 14	

* This exam is comprehensive, which means that it tests material from the whole course.

In addition to the aforementioned book (and other books, of course), your other resource to help you understand the material is me. If you have any question, comment or idea about multivariable calculus, come to me. I have allocated four hours to office hours, but you may also ask me to give you an appointment with me at other times. There may be times I will be forced to reschedule office hours. If this happens, I will notify you by email.

If you have difficulty with a problem, come to office hours well prepared. I suggest you to bring your notes so that you can show me exactly where you are stuck or confused.

3 Assessment

To have a rough idea of your mastery of the subject matter, you will be graded based on four elements: Homeworks, quizzes, exams, and participation.

3.1 Homework

Fourteen individual homeworks will be assigned throughout the term. Each homework will be graded on a scale from 0 to 100 points. These homeworks will be assigned and graded through WebAssign. The score

corresponding to homeworks that will be considered in the calculation of the final grade is going to be the average of all your homeworks throughout the term. The worst two homework scores will be dropped.

The tentative homework schedule is the following:

HW #	Due Date
1	September 3
2	September 10
3	September 17
4	September 24
5	October 1
6	October 8
7	October 15
8	October 22
9	October 29
10	November 5
11	November 12
12	November 19
13	November 26
14	December 3

3.2 Quizzes

There will be three quizzes during the course. Absences due to recognized University related activities, religious holidays, verifiable illness, and family/medical emergencies will be dealt with on an individual basis.

The quizzes are scheduled as follows:

Quiz #	Date
1	September 17
2	October 15
3	November 19

By University policy, digital calculators or any other similar devices, are not allowed during quizzes or exams.

3.3 Exams

There will be two midterm exams and a comprehensive final exam. As with quizzes, exam absences due to recognized University related activities, religious holidays, verifiable illness, and family/medical emergencies will be dealt with on an individual basis.

The exams are scheduled as follows:

Exam	Date	Book Sections
1	October 4	12.1 through 14.4
2	November 8	14.5 through 15.9
Final*	December 6–13	12.1 through 16.9 (Except 15.5 and 15.10)

*Check <http://www.udel.edu/exams> toward the end of the term to know the exact date and location.

4 Grading Policy

The final grade composition is as follows:

Component	Weight
Participation	5 %
Homeworks	10%
Quizzes	15%
Exam 1	20 %
Exam 2	20 %
Final	30 %

The category “participation” should be understood in broad terms. However, I will pay particular attention to office hours attendance, and in-class participation through specific exercises. **You should not assume that you have this 5% of your final grade already earned by default.**

Suppose your final score is X . The scale used in this course to map your point score to a letter grade is the following: $0 < X < 60$ for F, $60 \leq X < 63$ for D-, $63 \leq X < 67$ for D, $67 \leq X < 70$ for D+, $70 \leq X < 73$ for C-, $73 \leq X < 77$ for C, $77 \leq X < 80$ for C+, $80 \leq X < 83$ for B-, $83 \leq X < 87$ for B, $87 \leq X < 90$ for B+, $90 \leq X < 92$ for A-, $92 \leq X \leq 100$ for A.

5 Expected Behavior

5.1 Attendance

You are advised to attend all the scheduled meetings. Do not expect me to give you a private lesson during office hours on topics covered in a class you missed. Please see the University’s attendance policies for more information (Go to <http://academiccatalog.udel.edu> → 2013-2014 Undergraduate Programs → Academic Regulations for Undergraduates → UNIVERSITY ATTENDANCE POLICIES → Class Attendance).

5.2 Tardiness

Please arrive on time to avoid distracting your classmates (especially during exams or quizzes). If you need to arrive late or leave early please inform me in advance.

5.3 Academic Honesty

All University of Delaware Policies regarding ethics and honorable behavior apply to this course. The student guide to university policies (read more at: <http://www.udel.edu/stuguide/13-14/code.html#honesty>) is very clear: “All students must be honest and forthright in their academic studies. To falsify the results of one’s research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither give nor receive unauthorized assistance.”

6 Accessibility for Students with Disabilities

If you are a student with a disability and wish to request accommodations, please contact the Office of Disabilities Support Services, 325 Academy St. Suite 161, or call (302) 831-4643. Information regarding your disability will be treated in a confidential manner. Because many accommodations require early planning, requests for accommodations should be made as early as possible.

7 Disclaimer

The above schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances and/or to ensure better student learning.