Math 206: Vector Calculus

Course name: Math 206 - Vector Calculus (Section 1)

Instructor: Danny Crytser

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Meetings: TTh 8:30-10:00 in Valentine 106

Office hours: Monday and Wednesday 10:30-11:30, Tuesday 10:10-11:30, and by appointment. If you can't make it to scheduled office hours, please email me and we can definitely make an appointment.

Textbook: *Calculus: Multivariable* by Hughes-Hallett et al., 7th ed. You will get access to the book online via WileyPlus. (It is also possible to purchase a physical copy, but I don't necessarily recommend this.)

Course contents: This course is an introduction to vector calculus, which is a subject developed mainly to solve problems in physics. We will study line integrals (including the fundamental theorem of line integrals and Green's theorem), then study surface integrals and Stokes' theorem, and then pass on to Gauss' theorem/the divergence theorem about integrals over volumes. We will study many applications to physics and other subjects along the way.

Daily Worksheets: During each class meeting I will distribute worksheets for you to complete in groups.

Homework: There are written assignments due at the beginning of class every Thursday. They should be neatly written and stapled together.

Quizzes: There will be quizzes each Thursday at or near the end of class. These are not meant to be difficult and will mostly consist of near-duplicates of HW problems, or of problems from the daily worksheets.

Exams: Two midterms and a final. The midterms are on the weekly schedule on the next page. Please let me know if this schedule conflicts with any of your other commitments. Generally I will allow makeups for university-sanctioned activities and for medical/family emergencies, but not in any other case.

Grading:

Grading scale: Here is the conversion between percentage and four-point scale.

94-100	4.0	73-75	2.25
91-93	3.75	70-72	2.0
88-90	3.5	68-69	1.75
85-87	3.25	65-67	1.5
82-84	3.0	63-64	1.25
79-81	2.75	60-62	1.0
76-78	2.5	0-59	0

Weekly schedule: The schedule on the following page is *tentative*.

Class	Section	Topics
Th 1/18	1.1	Intro. The work done against a force field. Vectors and so on.
T 1/23	1.1	Remembering how to use vectors, and why. Thinking about work.
Th 1/25	1.2	Line integrals: the basic idea
T 1/30	1.2	Line integrals: actually computing them. Doing work.
Th 2/1	1.4	Remembering the gradient field of a function.
T 2/6	1.6	The Fundamental Theorem of Line Integrals: statement and examples
Th 2/8	1.6	The FToLI: advanced course. Path independence/Simply Connectedness
T 2/13	1.6, 1.3	EXAM 1.
Th 2/15	-	Mid-Winter Break: WOOHOO!
T 2/20	1.5	More conservative vector fields. Examples from physics.
Th 2/22	–	Remembering how to do double integrals.
T 2/27	2.1, 2.2	Green's theorem: statement and basic examples.
Th 3/1	2.2, 2.3	Green's theorem: advanced course.
T 3/6	2.3	Surfaces in $\mathbb{R}^3$. Parametric equations.
Th 3/8	2.4	The normal vector of a surface.
T 3/13	2.5	Flux integrals: introduction.
Th 3/15	–	Flux integrals: advanced course
T 3/20	–	Spring Break WOOHOO
Th 3/22	–	Spring Break WOOHOO, Ctd.
T 3/27	–	Flux integrals: Stokes' theorem!
Th 3/29	–	More Stokes' Theorem stuff.
T 4/3	3.3	Applying Stokes' theorem in physics.
Th 4/5	3.7	EXAM 2!
T 4/10	2.6	The divergence of a vector field. Relation with curl and grad.
Th 4/12	–	Remembering how to do triple integrals.
T 4/17	–	Gauss Theorem/Divergence Theorem.
Th 4/19	4.1	More Gauss's Theorem.
T 4/24	4.1	Differential forms.
Th 4/26	4.1	Differential forms.
T 5/1	4.4	Review.
Th 5/3	4.4, 4.3	More review.Last class!

FINAL EXAM: Tuesday, May 8th, 1:30-4:30 PM.

Accessibility: Please inform me of any additional accommodation you require for this course. The Disability and Accessibility Services center in 33 Whitman Annex are the people to talk to *first*; after you have spoken with them, please inform me of the specific plan that I need to help you implement in order for you to succeed. I'm more than happy to comply with whatever plan you make, but I need advance notice, especially **before exams**. If you come to me a couple minutes before the exam and announce that you require special accommodations, I may not be able to help on such short notice.

Academic honesty policy: Click on the link to the pdf at
`http://stlawu.edu/academic-affairs/resource/academic-honor-policy`
In this course you are encouraged to collaborate on HW, but don't copy your the work of your friends, and never cheat on quizzes or exams. When in doubt, please email me and I'll be very happy to clarify things for you.

Finally: Have fun! Vector calculus is a very elegant and useful subject, one that people actually use in real-world applications and one which solves important problems.