**SYLLABUS Fall 2015**

The University of Iowa

The College of Liberal Arts and Sciences

**Department of Mathematics**

**Engineering Math V: Vector Calculus (MATH: 3550: 0122 or 22M:037:0AAA)**

**1:30-2:20pm; MWF; 205 MLH (Lecture)**

**Website address**: [*http://homepage.math.uiowa.edu/~ichifan/teaching.html*](http://homepage.math.uiowa.edu/~ichifan/teaching.html)

Some of the policies related to this course (such as the drop deadline) are governed by its administrative home, the College of Liberal Arts and Sciences, 120 Schaeffer Hall.

**Instructor:** Ionut Chifan
Office location: 1R MLH

Office hours: M 3:30-4:30pm; WF 12:30-1:30pm and by appointment
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**DEO Contact Information:** Dan Anderson, 14 MLH, dan-anderson@uiowa.edu

**Description of Course:** The course is designed as a comprehensive introduction to vector calculus. It covers in detail many fundamental concepts vector calculus such as partial derivatives, min-max-problems, integration along curves surfaces and solids, Stokes Theorem, Divergence Theorems and classical partial differential equations. Special emphasis is placed on basic applications to engineering, physics, economics, and natural sciences.

 **Objectives and Goals of the Course:** The course is intended to familiarize the student with many of the fundamental concepts in calculus aforementioned**:** 2D material of the multivariable differential and integral calculus are now covered in 22M:032 and 22M:037 includes two-three weeks of PDEs. Topics covered include partial derivatives, max-min problems, integrals along curves, surfaces and solids, Stokes’ Theorem and the Divergence Theorem and classical partial differential equations. Although the course is part of the engineering sequence, it is not necessarily restricted to engineering students. To stimulate a broader audience the instructor will include in his presentations a wide range of applications of vector calculus to various problems applied mathematics, engineering, physics, biology and economics.

**Texts:**

 Required texts or materials (available at *Iowa Book Store*):

1. Second custom edition for The University of Iowa: *Calculus, Early Transcendentals*, Edwards and Penny, Pearson ISBN: 978-1-269-43198-9.

2. Chapter 10 of 10th Edition Boyce and DiPrima, *Elementary Differential Equations and Boundary Value Problems*. This is the textbook we used for 22M: 34 for many years. We started using 10th edition in Fall 2013. Some of the students in 22M: 37 may have taken earlier.

I will be covering the following chapters from the textbook (in the following order):

**Ch 11 – Vectors, curves, and surfaces in space**

Sections: 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7 (will be covered in Ch 13), 11.8 (will be covered in Ch 13)

**Ch 12 – Partial differentiation**

Sections: 12.1, 12.2, 12.3, 12.4, 12.5, 12.6, 12.7, 12.8, 12.9, 12.10

**Ch 13 – Multiple integrals**

Sections: 13.1, 13.2, 13.3, 13.4, 13.5, 13.6, 13.7, 13.8, 13.9

**Ch 14 – Vector valculus**

Sections: 12.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7

**Ch 10 – Switch to Boyce and DiPrima for PDEs**

Sections: 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, 10.8

**Grading System and the Use of +/-:** I will use the +/- grading system. You will be graded according to the following scale:

A [93,100); A- [90,93)

B+ [87,90); B [83,87); B- [80,83)

C+ [77,80); C [73,77); C- [70,73)

D+ [67,70); D [63,67); D- [40,63)

F [0, 40)

The grade of A+ will be awarded in extremely rare circumstances only for truly exceptional performance in class.

**Assignments and Percentage of Final Grade:**

Homework: 10 assignments 20%

Quizzes: 5 quizzes (on Fridays every other week) 10%

Midterms: 2 midterms

* Midterm I (on 9/23 during class time) 20%
* Midterm II (on 10/28 during class time) 20%

Final exam: Final (in class) 30%

**A Word about the Date and Time of the Final Exam:**

The date and time of every final examination is announced by the Registrar, generally by the tenth day of classes. **No exams of any kind are allowed during the last week of classes.** All students should plan on being at the UI through the final examination period. Once the Registrar has announced the date, time, and location of each final exam, the complete schedule will be published on the Registrar’s web site and will be shared with instructors and students. It is the student's responsibility to know the date, time, and place of the final exam.

**Course Policies:**

*Course attendance*: Attendance is expected for each class meeting, as it will help you better understand the concepts covered in lectures. If you miss a class, you are responsible for any assignments/announcements made/material covered*.*

*Participation in class discussions*: I strongly encourage you to actively participate in class discussions; ask questions or ask for more explanations whenever you feel confused; in this class there is NO stupid question! Also, as a general rule, for each lecture you should spend at least two hours on reading/homework/repeating the material, etc. You should start working over the homework problems right after the relevant sections are covered. If you encounter difficulties I strongly recommend you seek help immediately! Don't postpone it until one day before the exam! Also remember this: small deficiencies at the beginning tend to rapidly grow into big ones.

*Timely completion of assignments*: There will be approximately eleven weekly homework assignments primarily of problems from the book and other problems of my choosing. As the semester progresses, the assignments and their due dates will be announced during the lecture time. They will also be posted on my webpage right after the class. The lowest homework score will be dropped. The homework is always due on Friday at the beginning of the class. No late homework is accepted unless special circumstances. Solutions for the homework problems will be posted on Icon.

*Quiz policies:* There will be six quizzes given on Fridays during class time every other week (except for the week when you have exams). The lowest quiz score will be dropped. No make up quiz will be given unless special circumstances.

**Student Collaboration:** The homework for this course is designed to help you master your knowledge related to the topics covered during lecture. As such, you may work on the homework problems with others or use online resources. However, please be aware that to master the skills needed for this class, practice is required and that to do well on the final exam you will need to work many of these problems multiple times without help. Be sure to test your knowledge by doing much of the homework on your own. Even if you collaborate with your colleagues when solving the homework problems, I strongly encourage you not to copy, mot-a-mot, the solutions from others but instead try to write them in your own understanding. This is an excellent exercise proven to help students with material comprehension.

**Other Expectations of Student Performance:**

*Cell phones policy*: I am expecting you to NOT use your cell phones, i-pads, or computers during the lecture time for other purposes than class related. If you have to read or text a message during the lecture, please do it outside the classroom. During the exams, the cell phones are required to be placed (far) away, preferably at the bottom of your backpack. During the exams, you cannot hold them in your hand, not keep them on your desk, chair, or anywhere easily accessible, and you cannot use it as a calculator.

*Complaint procedure*: Any student having a problem with the course should contact the instructor. Most issues can be resolved with a straightforward discussion.

*Changing grade policy*: If I change your grade on a homework or exam you should always remind me in the same day by e-mail that I have changed your grade.

**Resources for Students:**
Students will find the Writing Center and the Speaking Center very useful for this course:
Writing Center: <http://www.uiowa.edu/~writingc/>
Speaking Center: <http://clas.uiowa.edu/rhetoric/for-students/speaking-center>

Math Tutorial Lab: 125 MLH http://www.math.uiowa.edu/math-tutorial-lab

**Calendar of Course Assignments and Exams:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Week | Beg - End | No. of lectures | Sections covered | Activities |
| 1 | 8/24 - 8/28 | 3 | 11.1-6 |  |
| 2 | 8/31 - 9/4 | 3 | 12.1-5 | Hw |
| 3 | 9/9 - 9/11 | 2 | 12.6-7 | Hw |
| 4 | 9/14 - 9/18 | 3 | 12.8-10 | Hw |
| 5 | 9/21 - 9/25 | 3 | 12.10-13.1 | Review,Exam I |
| 6 | 9/28 - 10/2 | 3 | 13.1-5 | Hw |
| 7 | 10/5 - 10/9 | 3 | 13.6-13.7 | Hw |
| 8 | 10/12 - 10/16 | 3 | 13.7-9 | Hw |
| 9 | 10/19 - 10/23 | 3 | 14.1-4 | Hw |
| 10 | 10/26 - 10/30 | 3 | 14.5-6 | Review,Exam II  |
| 11 | 11/2 - 11/6 | 3 | 14.6-14.7 | Hw |
| 12 | 11/9 - 11/13 | 3 | 10.1-4 | Hw |
| 13 | 11/16 - 11/20 | 3 | 10.5-6 | Hw |
| 14 | 11/30 - 12/4 | 3 | 10.7 | Hw |
| 15 | 12/7 - 12/11 | 3 | 10.8 | Review, Final |

**Teaching Policies & Resources — Syllabus Insert**

**Administrative Home**

The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Academic Policies Handbook at <http://clas.uiowa.edu/students/handbook>.

**Electronic Communication**

University policy specifies that students are responsible for all official correspondences sent to their University of Iowa e-mail address (@uiowa.edu). Faculty and students should use this account for correspondences ([Operations Manual, III.15.2](http://opsmanual.uiowa.edu/human-resources/professional-ethics-and-academic-responsibility#15.2), k.11).

**Accommodations for Disabilities**

A student seeking academic accommodations should first register with Student Disability Services and then meet with the course instructor privately in the instructor's office to make particular arrangements. See <http://sds.studentlife.uiowa.edu/> for more information.

**Academic Honesty**

All CLAS students or students taking classes offered by CLAS have, in essence, agreed to the College's [Code of Academic Honesty](http://clas.uiowa.edu/students/handbook/academic-fraud-honor-code): "I pledge to do my own academic work and to excel to the best of my abilities, upholding the [IOWA Challenge](http://fye.uiowa.edu/youre-here/iowa-challenge). I promise not to lie about my academic work, to cheat, or to steal the words or ideas of others; nor will I help fellow students to violate the Code of Academic Honesty." Any student committing academic misconduct is reported to the College and placed on disciplinary probation or may be suspended or expelled ([CLAS Academic Policies Handbook](http://clas.uiowa.edu/students/handbook)).

**CLAS Final Examination Policies**

The final examination schedule for each class is announced by the Registrar generally by the fifth week of classes. Final exams are offered only during the official final examination period. No exams of any kind are allowed during the last week of classes. All students should plan on being at the UI through the final examination period. Once the Registrar has announced the date, time, and location of each final exam, the complete schedule will be published on the Registrar's web site and will be shared with instructors and students. It is the student's responsibility to know the date, time, and place of a final exam.

**Making a Suggestion or a Complaint**

Students with a suggestion or complaint should first visit with the instructor (and the course supervisor), and then with the departmental DEO. Complaints must be made within six months of the incident (CLAS [Academic Policies Handbook](http://clas.uiowa.edu/students/handbook)).

**Understanding Sexual Harassment**

Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI [Office of the Sexual Misconduct Response Coordinator](http://osmrc.uiowa.edu/) for assistance, definitions, and the full University policy.

**Reacting Safely to Severe Weather**

In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the [Department of Public Safety website](http://police.uiowa.edu/emergency-communications).