

Spring 2015

MATH 3510(H) SYLLABUS

T. Shifrin

Text: Theodore Shifrin, *Multivariable Mathematics: Linear Algebra, Vector Calculus, and Manifolds*, John Wiley & Sons, 2005.

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Web page for the class: <http://www.math.uga.edu/~shifrin/MATH3510>

Log in to **WeBWork** at https://webwork.math.uga.edu/webwork2/MATH3510_Shifrin_S15

Office Hours: to be decided in class and posted on the web page.

This is the second semester of a theoretical and more challenging amalgamation of MATH 2270/2500 and MATH 3000. Proofs of theorems and additional physical applications will be stressed, and harder computational problems will be included.

You are expected to attend class *every day*, participate in class, and read the text and do homework *every night*. I encourage (indeed, expect) you to come regularly to office hours, but *you must have thought about and attempted the problems first*. Homework will be collected once a week and *selected exercises* will be graded carefully. Please write up your problems clearly: A classmate (or you, a few weeks later) should be able to understand your solution fully. The computational portion of the homework will be WeBWork problems that you do on-line; to help you study for exams, I recommend that you keep a notebook in which you work these problems neatly. “Challenge problems” will count as extra credit (up to 10% of your grade). Your grade will be calculated as follows:

hour exams (3)	30%
final exam	30%
homework and class participation	30%
your best component	10%

Hour exams are tentatively scheduled for February 3, March 3, and April 14, 2015. The last day to withdraw with a W is March 19, 2015. The final exam is Friday, May 1, 2015, 12:00–3:00 pm.

N.B.: No late homework or makeup exams. Although I encourage you to work on homework with one or two other students, you must write up your assignments by yourself. Perusing the Instructors’ Solutions Manual is considered unethical and dishonest. You must comply with UGA’s Academic Honesty Policy; see items 3, 4, 5, and 6 at <http://ovpi.uga.edu/academic-honesty/academic-honesty-policy>. All students are responsible for maintaining the highest standards of honesty and integrity in every phase of their academic careers. The penalties for academic dishonesty are severe; note that “lack of knowledge of the provisions of this policy is not an acceptable response to an allegation of academic dishonesty.”

Course Outline for MATH 3510(H)

1. Integration, applications to physics, determinants and the Change of Variables Theorem. (Chapter 7)
2. Contraction mapping, Inverse and Implicit Function Theorems, and manifolds. (Chapter 6)
3. Differential forms and integration on manifolds. Stokes’s Theorem. Applications to physics (div, curl, and all that) and topology. Time permitting: Comments on complex variables. (Chapter 8)
4. Eigenvalues and eigenvectors, difference and differential equations, spectral theorem and applications to quadratic forms. (Chapter 9)