PHY 311 - Mathematical Physics

Syllabus **Dr. R.L. Herman** **Spring 2012**

Instructor: Dr. R. Herman
Office Hours:
MTWR 9:30-11 AM, F 9:00-10:00 AM
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Course Content:

Required Text: *An Introduction to Mathematical Physics via Oscillations*, R. Herman, 2012. (online text)

In this course you will be introduced to some of the standard mathematical topics that are useful in physics. The typical topics covered in a course on mathematical physics are vector analysis, vector spaces, linear algebra, complex variables, power series, ordinary and partial differential equations, Fourier series, Laplace and Fourier transforms, Sturm-Liouville theory, special functions and possibly other more advanced topics.

We will also cover these topics, but will do so in the guise of exploring specific physical problems. This course will have a theme: Oscillations. Many of the topics in mathematical physics stem from studying simple harmonic motion and the wave equation. As we progress through the course, we will see these connections. The text originated as a set of notes tying together physics problems and the mathematics used in solving them.

The general learning goals of this course are for you to

1. Develop adeptness at applying the above mathematical tools to physics problems, and
2. Prepare for using these tools in your upper level physics courses and the real world.

Materials on the Web

More information will be posted on the web related to the topics we are studying. Links can be found with summaries to the material, study suggestions, homework assignments, etc. These will be accessible through the instructor's home page at

http:/people.uncw.edu/hermanr/phy 311

Course Requirements:

Homework: Homework assignments will be collected on a regular basis and you will be told when the work is due. As doing homework is very important for learning the material in this course, it will count as 30% of your grade. Late homework will be given a late penalty depending upon how late it is.

Projects: Some of the interesting problems in physics require a little more work than a typical homework problem as they are either computationally tedious or next to impossible. Some problems cannot be solved analytically and are more readily solved using computer. Therefore, to give you a change to do something a bit more challengingand possibly open up ideas for future research projects, you will be assigned at least one major project. This will count 10% of your grade.

Exams and Grades: There will be three exams and a final for this course. The exams will cover the basic material up to the date of the exam. The tentative dates for the exams are below.

Exam I - Ch 1-3	Feb 6
Exam II: Ch 4-6	Mar 21
Exam III: Ch 7-8	Apr 25
Final: Ch 1-9	May 2, 8:00 AM

Your final grade will be based on the following:

Homework	30%
Projects	10%
Exams	45%
Final	15%

89.5-100	A
79.5-89.5	B
69.5-79.5	C
59.5-69.5	D

Homework Assignments

You are required to turn in all of the assigned problems for grading on the due date. All work is expected to be neat, in order and with all work provided. Homework assignments will be listed at the course website.

This syllabus is subject to change!

Academic Honor Code: All members of UNCW's communityare expected to follow the academic Honor Code. Please read the UNCW Honor Code carefully (as covered in the UNCW Student Handbook). Academic dishonesty in any form will not be tolerated in this class. Please be especially familiar with UNC-W's position on plagiarism as outlined in the UNCW Student Handbook. Plagiarism is a form of academic dishonesty in which you take someone else's ideas and represent them as your own.

Student Disabilities: UNCW Disability Services supplies information about disability law, documentation procedures and accommodations that can be found at http://www.uncw.edu/stuaff/disability/ . To obtain accommodations the student should first contact Disability Services and present their documentation to the coordinator for review and verification.