PHYS 389

Mathematical Methods in Physics I

Fall 2016 (Class #19510)
Tue/Thu 3:30 – 4:45 PM, LO 1124

Instructor: Prof Dr Wladimir Lyra
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Office: Live Oak, 1119-G
Office Hours: Thursdays 2:30-3:30 PM

Preferred communication method: email.

Course description

An introduction to the mathematical methods used in junior and senior level physics courses. Topics covered include vector analysis, linear algebra, and partial differentiation.

Course Objectives

The course is intended for the student with one or two years of calculus who wants to develop a basic competence in each of the many areas of mathematics needed in junior, senior, and graduate courses in Physics and Astronomy. Upon completion, the student will have gained knowledge and understanding of the fundamental mathematical tools used in several branches of physics. The student will be able to apply these principles to solve several problems of theoretical physics.

Course Prerequisites

PHYS 227; MATH 280 or MATH 351. All pre-requisites will be strictly enforced. None of the pre-requisites can be taken concurrently with this course.

Grading

The grade will range from 0 to 100, and then converted to letter format. Plus and minus grades (i.e. B+) will be used. The conversion is

A	95-100	C	70-75
A-	90-94	C-	68-69
B+	88-89	D+	66-67
B	80-87	D	55-65
B-	78-79	D-	50-54
C+	76-77	F	Below 50

Materials

- Textbook: **Mathematical Methods in the Physical Sciences**, Boas. 3rd edition (ISBN-13: 978-0-471-19826-0, ISBN-WIE-13: 978-0-471-36580-8)
- Scientific Calculator (or computer)
- **CSUN Moodle** will be used for lecture notes, pre-lecture check-points, in-class and group uploads

Milestones

Midterm – 10/13/16, 3:30-4:45PM, LO 1124.

Final – 12/13/16, 3-5PM, LO 1124.

The grade will consist of homework (HW), midterm (MT) and final exam (FE).

Grade = (HW + MT + FE)/3

There will be weekly homework assignments. Each assignment is worth 100 points, the HW grade is HM = $(\Sigma_{i=1,n}\ HW_i)/n$

Late homework policy

If you are late with homework, your grade will be given by

$$grade(t) = grade\_orig * \exp(-t/\tau)$$

where grade_orig is the grade your homework would be worth if turned in at the deadline, t is time past the deadline, and $\tau = 86400$ s. Late homework will only be accepted via email; the time t given by the time stamp in the email.

Course notes

Lectures will mainly be standard blackboard lectures with demonstrations, but slides, images, and videos will be used when appropriate. In such case, they will be posted on Moodle. The notes will be posted on Moodle, but students are encouraged to take their own hand-written notes to better follow the material.

Office hours

The office hours are on Thursdays from 2:30pm to 3:30pm. Other times by appointment only, as I may have a meeting or be engaged elsewhere. If you are able to phrase/illustrate your doubt in a clear way in writing, you are welcome to reach me by email.

Topics to be covered

This is a preliminary list of the topics that will be covered. The list is dynamic and will be updated as the course goes, based on how in depth we decide to go on some topics and also the interests of the class.

1. Taylor Series
2. Complex Numbers
3. Linear Algebra
4. Partial Differentiation
5. Multiple Integrals
6. Vector Analysis
7. Fourier Series and Fourier transforms
8. Ordinary and Partial differential equations

Student Responsibility

You, as the student, are responsible for all material presented in class and in assignments, and for any announcements made during class time (which may include changes to the schedule), whether you are present or absent. It is your responsibility to attend and keep up with the rhythm of the class.

Class attendance is essential for the understanding of the material. If you should decide to drop the class, you must do so before the deadline listed in the schedule of classes, or a grade will be assigned. Dropping the class is the student's responsibility, not the instructors.

Use of Laptop Computers & Mobile Phones

You may use a laptop computer in the classroom only for class purposes. You may not surf the web, play games, or engage in any activity, which I would consider disruptive to you, or students around you. Mobile phones must be turned to silent mode, and can only be used to participate in class. You may not use your portable phone in lieu of a scientific calculator.

Use of Listening, Video, or Other Recording Device

The use of any electronic listening, or recording devices by anyone in class are not permitted. If you need to use a recording device as an authorized disability accommodation, you must provide me with verification from the Disability Resources and Educational Services (DRES) prior to the use. The DRES office is located in Bayramian Hall, room 110 and can be reached at 818.677.2684.

Disability Accommodation Statement

If you have a disability and need accommodations, please register with the DRES office or the National Center on Deafness (NCOD). NCOD is located on Bertrand Street in Jeanne Chisholm Hall and can be reached at 818.677.2611. If you would like to discuss your need for accommodations with me, please contact me to set up an appointment.

Academic Dishonesty Policy

Violations of Academic Integrity include, but are not limited to: cheating on an exam, plagiarism, working together on an assignment, paper, or project when the instructor has specifically stated students should not do so, submitting the same piece of work to more than one instructor, or allowing another individual to assume one's identity for the purpose of enhancing one's grade. Cheating will result in a letter grade of "F" equivalent to zero points for that particular assignment and/or test, any previous assignments will be called into question, and may result in a final grade of "F" for the course. Dishonesty will be dealt with along the University's guidelines and reported to the office of Student Affairs.

Support Services for Students

- **Learning Resource Center**: http://www.csun.edu/lrc/, 818.677.2033, Bayramian Hall 408. The mission of the LRC is to enable students to improve their academic performance through a variety of learning programs including workshops, one on one and group tutoring, Supplemental Instruction classes and interactive subject area computer programs and videos. Students who use LRC learning programs will develop and strengthen their critical thinking skills, study strategies, writing skills and performance in subject matter courses.

- **Academic Advisement**: http://www.csun.edu/ugs/advisement.html. The college-based academic advisement centers are available to assist students in selecting courses and programs of study and in choosing or declaring a major or minor. Visit the website to locate the advising center for your major, or for undeclared majors.

- **University Counseling Services**: http://www.csun.edu/counseling/, 818.677.2366, Bayramian Hall 520. UCS provides resources and information to assist students in dealing with a variety of large and small psychological obstacles that may interfere with academic progress and/or relationship satisfaction. Services include individual, group and crisis counseling.

- **Center on Disabilities**: http://www.csun.edu/cod/studentservices.htm, 818.677.2684, Bayramian Hall 110. The Center on Disabilities serves students with a wide range of visible and hidden disabilities, in a confidential environment. Students are encouraged to meet with the professional staff and explore the services available to support their academic, career and personal goals. Discover accommodations and strategies for help with disabilities in an academic setting.

- **The Career Center**: http://www.csun.edu/career/students/, 818.677.2878, University Hall 105. Need some help in deciding on a career? Or do you know your career and need to meet employers? Perhaps your resume needs some sprucing up? The Career Center offers a variety of services for students, from those new to the University to those about to graduate into the world of work.

This syllabus may be subject to change.