

Phys 6070 Mathematical Methods of Physics

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Textbook: Mathematical Methods for Physicists, 7-th edition
G.B. Arfken, H.J. Weber, F.E. Harris
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Meeting times: scheduled time: MWF 1:00pm ... 1:50pm

Office hours: MWF, 11:00 am – 11:50 am; other times by appointment

Class format: The best way to study mathematical methods is by doing the problems. Therefore, students are required to read and work through the relevant material before the class. The instructor will summarize the material during one class per chapter. Students will solve and discuss selected homework problems during the rest of the classes.

Prerequisites: All students should be fluent in undergraduate-level calculus

Homework grading policy: Student's performance while solving the problem on the blackboard will count towards 50% of homework score. The other 50% of homework score will be based on graded homeworks. Teamwork is permitted and encouraged during homework solutions. However, it must be acknowledged.

Quizzes: will be based on material covered in class. Quizzes are closed/books/notes, and will be assigned throughout the problem-solving classes;

Midterm exam: is closed books, closed notes, based on problems assigned for in-class and homeworks.

Final exam is closed books, closed notes, based on homework problems and on problems posted online. One single-sided formula sheet (prepared by the students) will be available during final exam.

Regrade policy: It is student's responsibility to prove that grading mistake has been made. When the issue of the regrade concerns the general method of solving the problem, partial credits, etc., the student will be asked to solve the problem on the blackboard in with closed books/closed notes. The instructor will then question the student on the related course material, and assign a new grade for the problem. The new grade can be higher or lower than the original grade.

Grading policy: The grade is determined according to the total score based on:

In-class performance/homeworks:	30%
Quizzes	20%
Midterm:	25%
Final exam:	25%

E-mail communication with instructor: The instructor will use ISIS to e-mail important course updates, class notes, etc. to the class. It is assumed that the students regularly check their e-mail.

Missed classes/exams/homeworks: as a rule, there are no makeup exams/homeworks/quizzes. In extraordinary circumstances (severe illness, jury duty, etc.) the homework may be postponed, the quiz/midterm grade may be prorated, or the makeup exam can be arranged. In these cases, the student must inform the instructor as early as possible, and obtain a written approval.

Academic integrity: any suspected cheating or other academic fraud cases will be reported and prosecuted according to UML policy: (<https://www.uml.edu/Catalog/Graduate/Policies/Academic-Integrity.aspx>)

Students with disabilities: will be accommodated according to general policy of the University. Please contact Disability Services at Wellness Center (x4-6800)

Tentative Course Schedule: (Updated versions will be posted online/e-mailed to the class.)

Week#	Dates	Chapter	In-class work	HW
1,2	Sep 4, 6 Sep 9, 11, 13	3.10 curved coordinates 4 Tensor analysis	3.10.1, 3.10.4, 3.10.5, 3.10.10, 3.10.26 4.1.1, 4.1.5,4.1.7, 4.1.10, 4.2.2, 4.3.6	3.10.6, 3.10.8, 4.1.6,4.1.8, 4.3.2 (due Sep. 20)
3,4	Sep 16, 18, 20 Sep 23, 25, 27	5.1-5.2 Gram-Schmidt orthogonalization 8.1-8.3 Sturm-Liouville Theory	5.1.2, 5.1.4, 5.2.2, 8.2.1, 8.2.6, 8.2.8,8.3.1	5.1.3, 5.2.1, 8.2.3,8.2.9,8.3.3 [due Oct.4]
5,6	Sep 30, Oct 2,4 Oct 7,9,11	14.1-14.7 Bessel Functions	14.1.1, 14.1.2, 14.1.4,14.1.7, 14.1.10, 14.2.2, 14.2.6, 14.2.7, 14.3.5, 14.5.1, 14.5.2(a), 14.7.2, 14.7.6	14.1.6,14.1.11, 14.2.8,14.3.2, 14.5.2(b) [due Oct 18]
7,8	Oct 15, 16, 18 Oct 21, 23 ^s , 25	15.1-15.6 Legendre Functions	15.1.5, 15.1.9, 15.1.12, 15.1.14, 15.2.1, 15.2.3, 15.4.3,15.4.13,15.6.2(a)	15.1.6, 15.2.7, 15.3.5, 15.4.7, 15.6.2 (b) [due Nov 1]
9,10,11	Oct 28,30, Nov <u>1</u> Nov 4, 6, 8 Nov 13,15	11 Complex variable theory	11.2.7, 11.2.9(a,b,d), 11.3.3, 11.3.7, 11.4.4, 11.4.6, 11.5.3, 11.5.5, 11.6.2	11.2.9(c,e), 11.3.6, 11.4.3, 11.4.8,11.6.3 (due Nov 22)
12,13, 14,15	Nov 18, 20,22, Nov 25, Dec. 2,4,6 Dec. 9,11	11 Complex variable theory	11.7.1(a,c,e, h),11.8.1, 11.8.2,11.8.8, 11.8.13, 11.8.15, 11.8.18b, 11.10.3, 11.10.4	11.7.1(b,g), 11.8.3, 11.8.9, 11.8.16, 11.10.5 Bonus:11.8.18a (due Dec.11)