PHYS 343: Introduction to Mathematical Physics Spring 2016

Teacher: Dr. Kelly Krieble Office: Room 109, Collier Hall of Science	Classroom: CHS 206 M,W,F 10:20-11:30am
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Goals of the course:

The purpose of this course is to introduce students of the physical sciences to the mathematical methods which are essential to the solution of practical problems. The methods which will be presented are those which are most frequently used in typical physics and engineering applications. The subject matter is not intended to be all-inclusive. Each unit of the course will provide an in-depth treatment of a particular subject area. Students will be encouraged to consult various reference books in expanding their knowledge and expertise in any of the areas that are introduced.

Undergraduate education in the physical sciences continues to become more advanced and sophisticated. As a result, mathematical topics previously reserved for graduate study have become part of the undergraduate program. Consequently, it has not been particularly simple to determine just which mathematical methods and models should be included in a one-semester course. The choices which have been made represent a fairly broad spectrum of commonly encountered subject areas. The coverage is at a level compatible with a concurrent enrollment in a standard differential equations course.

The course will begin with an overview of linear algebra. Specific problems with numerical data will be used to introduce the topics but eventually general literal solutions will be derived. A first goal will be the successful solution of the assigned homework problems; a final goal will be the application of techniques learned in this course to problems assigned in other upper level physics courses.

Course Texts: Mathematical Methods in the Physical Sciences, 3nd ed., Boas. Suggested supplemental texts: CRC Standard Math Tables; Used Math, Swartz.

Course Content and Schedule of Topics:

Торіс	Approximate Time Span	Readings
1. Matrices and Linear Algebra	2 weeks	Chapter 3, 5
2. Ordinary Differential Equations	3 weeks	Chapter 8
3. Laplace Transform	2 weeks	Chapter 8
4. Power Series	2 weeks	Chapters 12
5. Fourier Series	2 weeks	Chapters 2, 7
6. Numerical Methods	2 weeks	Throughout

Grading Policy:

- A = 90%-100%
- B = 80%-89%
- C = 70%-79%
- D = 60%-69%
- F = below 60%

Assessment:	% Weight
Homework Problems	40
Exams	45
Final Exam	15

Homework Problems:

Your work on these problem sets will be bound by the Moravian College Policy on Academic Honesty in the Student Handbook. The due dates for each assignment will be stated when the assignment is handed out. There will be a 50% deduction for tardy work up until solutions to the homework are posted in the periodical room (CHS 117). Work submitted after that time will receive a zero.

Exams:

Approximately every three to four weeks an exam will be given during class.

Final comprehensive exam:

An exam on all material covered during the semester.

Attendance Policy:

Students are expected to come to class. To that end, I WILL take attendance, and reserve the right to raise/lower your grade based on your attendance.

Statement on disability:

Students who wish to request accommodations in this class for a disability should contact the Academic Support Center, located in the lower level of Monocacy Hall, or by calling <u>610-861-1401</u>. Accommodations cannot be provided until authorization is received from the Academic Support Center.

The Writing Center is located in a building that is not accessible to persons with mobility impairments. If you need the services of the Writing Center, please call 610-861-1392.

Good luck in the coming year. Should you have any comments about the class during the semester, please feel free to discuss them with me - I will welcome any suggestions for improving the course. Since I am looking for you to do your best work, you should demand excellence from me as well.

Subject to revision