PHYSICS 3700: Mathematics for Biomedical Physics

COURSE OUTLINE: FALL 2013

LECTURER: J. M. Wadehra

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OFFICE HOURS: Mondays and Wednesdays from 11:00 AM to 12:00 Noon or by appointment or, simply, drop by.

TEXT: *Further Mathematics for the Physical Sciences* by M. Tinker and R. Lambourne (John Wiley & Sons)

COURSE PREREQS: PHY 2130/2140 or PHY 2170/2180; MAT 2010; MAT 2020; current GPA more than 3.0

MEETING PLACE: Mondays and Wednesdays from 1:55 PM to 3:55 PM in Room 245, Physics Research Building

1. **EXTRA READING**.

The assigned text covers all the material for this course. A few reference books that cover similar materials at roughly the same level are:

Mathematical Methods in the Physical Sciences by M.L. Boas	(John Wiley & Sons, 2006)
Basic Training in Mathematics by R. Shankar	(Springer, 2006)
Mathematical Handbook of Formulas and Tables by M.R. Spiegel	(McGraw-Hill, 2008)

You may wish to refer to these books for additional reading about topics that interest you.

2. **HOMEWORK ASSIGNMENTS**.

A few problems from the text and from other sources will be assigned almost every week. You are expected to work out these assignments *independently* and turn in the solutions for partial grading by due date. Late homework assignments will not be accepted.

3. **EXAMS AND GRADING**.

Your grade in the course will be determined, as follows, by your performance in three exams, in-class weekly quizzes and in solutions of assigned homework problems:

First Hourly Examination	100 points	A: 450-500 pts; A-: 425-449 pts;
Second Hourly Examination	100 points	B+: 400-424 pts; B: 375-399 pts;
Final Examination	200 points	B-: 350-374 pts; C+: 325-349 pts;
In-class Weekly Quizzes	50 points	C: 300-324 pts; C-: 275-299 pts;
Homework	50 points	D+: 250-274 pts; D: 225-249 pts;
TOTAL	500 points.	D-: 200-224 pts; F: 0-199 pts.

Tentative dates for hourly exams are Wednesday, October 2 and Wednesday, November 6; these exams will be held in the classroom. Results of the hourly exams as well as the graded homework problems/weekly quizzes will be handed back in the class. The final exam will be on Wednesday, December 11 from 1:20 PM to 3:50 PM in room 245 of Physics Research Building. The final exam will cover all the material of this course; however, there will be slight emphasis on material not covered by the first and the second hourly exams.
THERE WILL BE NO MAKE-UP EXAMS OR QUIZZES.

4. **TOPICS TO BE COVERED.**

I anticipate that we will be covering most of the topics of the textbook during this semester. Additional topics include Fourier series, Fourier transforms, probability and statistics.

Schedule of PHY 3700: Fall 2013

Date	Topics	Quiz/Exam
W 8/28	Diagnostic Test	
W 9/4	Differential Calculus, Partial Derivatives, Lagrange Method	
MW 9/9 9/11	Wave Equation, Implicit Derivative, Integral Calculus	Quiz 1
MW 9/16 9/18	Leibnitz Rule, Integral Calculus	Quiz 2
MW 9/23 9/25	Finite and infinite series	Quiz 3
MW 9/30 10/2	Series of Variables	EXAM 1
MW 10/7 10/9	Fourier Series	Quiz 4
MW 10/14 10/16	Fourier Transforms, Complex Variables	Quiz 5
MW 10/21 10/23	Determinants, Vectors	Quiz 6
MW 10/28 10/30	Vector Calculus	Quiz 7
MW 11/4 11/6	Vector Calculus	EXAM 2
MW 11/11 11/13	Spherical and Cylindrical Coordinates	Quiz 8
MW 11/18 11/20	Multiple Integrals	Quiz 9
M 11/25	Matrices	
MW 12/2 12/4	Differential Equations, Diffusion Equation	Quiz 10
M 12/9	Probability Distribution Function	
W 12/11	Catch-Up	FINAL EXAM