

**PHY4936, Section 001, Mathematical Methods in Physics II(Spring 2020)**, counts as elective  
**Instructors:** Dr. Inna Ponomareva; Office: ISA 5103; E-mail: iponomar@usf.edu; telephone:  
974-7286, Dr. Sergey Lisenkov; Office ISA 5104; E-mail: slisenk@usf.edu  
**Text:** Mathematical Methods in the Physical Sciences, 3<sup>rd</sup> ed; Publisher: Wiley; Author: M.L. Boas  
**Class:** MW 12:30pm-1:45pm ISA 2051

**Problem-solving class:** F 12:00 pm-12:50 pm ISA 4027

**Office Hours:** MW 2:00pm-3:00pm and by appointment.

**Course prerequisites:** Mathematical Methods in Physics I

### **Course Outline and Objectives**

The course is designed to develop the basic mathematical skills required to succeed as majors in physics at the undergraduate level and covers the topics not typically included in one semester Math Methods course. Strong emphasis will be on the fundamentals, and the particular topics will include complex numbers and functions of a complex variable, calculus of variations, tensor analysis, special functions, Fourier series and transforms, series solutions of differential equations, and probability and statistics. The skills learned in this course will be used in subsequent courses in physics as well as to form the basis for a fundamental understanding of the mathematics needed in physics. The main ideas are understood and re-enforced by developing conceptual problem-solving skills. This is important in understanding the material, and success in the course; therefore, problems will be assigned from each chapter of the text. I will also include illustrative problems that represent a fundamental understanding of the material as applied to physics. After we complete each chapter in the text, I will ask for some of the assigned problems from that chapter to be handed in. These problems will be due at the beginning of the first lecture of the next chapter. In addition, there will be a quiz after each chapter that emphasizes basic concepts of the material learned. I will give exact dates for these quizzes about one week in advance. In studying for the quizzes and examinations you are encouraged to work on problems in the book in addition to those assigned. Please read the text before each lecture. Although I will not require attendance, it is paramount that you come to every lecture in order to keep up with the work. Please come see me during office hours if you have missed a lecture to get 'up to speed' on the course work.

<b>Course Grading Breakout</b>	Assigned Problems	20 %	
	Quizzes	20 %	(best 5 out of 8 quizzes)
	Mid-term Exam	30 %	
	Final	30 %	

Extra points will be offered for attendance\*

\* To qualify for extra credit for attendance students must attend 22 out of 28 classes excluding Midterm and 11 out of 14 problem-solving classes on Friday. The extra credit will be in the form of grade increment. For example, if student earns B+ and qualifies for extra credit, the final grade will be A-.

### **Course Grading**

93.00 – 100.00	A
90.00 – 92.99	A-
87.00 – 89.99	B+
83.00 – 86.99	B
80.00 – 82.99	B-
77.00 – 79.99	C+
73.00 – 76.99	C
70.00 – 72.99	C-
67.00 – 69.99	D+
63.00 – 66.99	D
60.00 – 62.99	D-
< 59.99	F

## Tentative Schedule and Examination Dates

Week Beginning	Topics (Chapters in Text)
Jan 12	Calculus of Variations (9)
Jan 19	
Jan 26	Complex Numbers (2)
Feb 2	
Feb 9	Function of a Complex Variable (14)
Feb 16	
Feb 23	Fourier Series and Transforms (7)
Mar 1	
Mar 8	Mid-term on Chapters 9, 2, 14 & 7 + Ch. 7 Quiz on Mon Mar 9, Tensor Analysis (10)
Mar 15	Spring break
Mar 22	
Mar 29	Probability and Statistics (15)
Apr 5	
Apr 12	Special Functions (11)
Apr 19	Series Solutions of Differential Equations (12)
Apr 26	
May 3	FINAL on Chapters 10, 15, 11 and 12 + Ch. 12 Quiz, Wed May 6, 10:00am-12:00pm.

### NOTE

Students who anticipate being absent from exams due to a major religious observance must provide notice of the date(s) and event(s) to the instructor, in writing, by the second class meeting. Notes and Tapes are not permitted for purposes of sale.

Any student with a disability is encouraged to meet with me privately during the first week of class to discuss accommodations. Each student must bring a current Memorandum of Accommodations from the Office of Student Disability Services (974-4309, SVC1133) which is prerequisite for receiving accommodations. Accommodated examinations through the Office of Student Disability Services require at least two weeks notice.