Phys601:
Methods of Theoretical Physics II
Spring 2024

Lecture Times: Tue/Thu 12:00 -- 1:15pm
Place: Physics 331
Instructor: Prof. Dimitrios Giannios
office room: 325 Physics;
office hours: after class or by appointment (email me for arrangements)
email: dgiannio@purdue.edu
TA: Haotian Zhou
Office hours: by appointment (zhou825@purdue.edu)
Course Page: Brightspace, where announcements and lecture material are found

• **Syllabus:** the course *loosely* follows Arfken's book. We study

I. Calculus of variations
II. 2nd order linear differential equations
III. The Γ function
IV. Probability theory and Distributions
V. Green's function technics
VI. Integral Equations

• **Schedule**:
Week 1: (1/9; 1/11) Syllabus, Calculus of variations
Week 2: (1/16; 1/18) Calculus of variations
Week 3: (1/23; 1/25) Calculus of variations
Week 4: (1/30; 2/1) 2nd order linear differential equations
Week 5: (2/6; 2/8) 2nd order linear differential equations
Week 6: (2/13; 2/15) differential equations, the Γ function
Week 7: (2/20; 2/22) the Γ function
Week 8: (2/27; 2/29) Probability Theory
Week 9: (3/5; 3/7) Material Review; Midterm I
Spring Break Week
Week 10: (3/19; 3/21) Probability theory and Distributions
Week 11: (3/26; 3/28) Green's function technics
Week 12: (4/2; 4/4) Green's function technics
Week 13: (4/9; 4/11) Integral Equations

Week 14: (4/16; 4/18) Integral Equations
Week 15: (4/23; 4/25) Integral Equations, Material Review

• **Homework:** Homework will be assigned every 1 or 2 weeks and will be due by class time the Tuesday after it has been assigned. Expected HW due dates: HW#1: 1/23; HW#2: 1/30; HW#3: 2/13; HW #4: 2/20; HW#5: 2/27; HW#6: 3/5 HW#7: 3/26; HW#8: 4/9; HW#9: 4/23

• **Exams/Grading:** There will be a midterm and final exam. The midterm counts for 40% of the grade and the final for 40%. Homework counts for 20%. You need at least 60% average to pass this class. Tentative Midterm date: March 7th.

• **Textbook**:
Mathematical Methods for Physicists, G. B. Arfken, H. J. Weber & F. E. Harris (7th edition). For electronic access to textbook:
https://purdue.primo.exlibrisgroup.com/permalink/01PURDUE_PUWL/uc5e95/alma99169138681701081