PHYS 3900: Methods of Mathematical Physics

Instructor: W. M. Dennis


Office Hours: Any Time

Exams: Test I, Test II, Final (All Closed Book)

Homework: Will assign problems. Selected Problems will be graded.

Grade: Total Grade = (Homework + Test I + Test II + Final)/4

Grading Scheme: $A \equiv [85, 100], B \equiv [70, 85), C \equiv [55, 70), D \equiv [40, 55), F \equiv [0, 40)$

Absences Final Grade Substituted for Excused Tests

1. Complex Analysis I
   (a) Complex Numbers
   (b) Functions of a Complex variable

2. Infinite Series
   (a) Power Series
   (b) Maclaurin and Taylor Series
   (c) Other Methods of Series Calculation
   (d) Convergence Tests
3. Linear Algebra
   (a) Matrix Multiplication
   (b) Determinants
   (c) Matrix Inverse
   (d) Eigenvalues and Eigenvectors

4. Vectors
   (a) Scalar and vector products
   (b) Scalar and vector fields
   (c) Vector Calculus
   (d) Chain rule
   (e) Div, Grad, Curl and all that!
   (f) Line and Surface integrals
   (g) Divergence and Stokes theorems

5. Differential Equations
   (a) First order ODEs
   (b) Second order ODEs with constant coefficients
   (c) Variation of parameters
   (d) Series Solutions

6. Fourier Transforms
   (a) Fourier Series
   (b) Fourier Integrals

7. Complex Analysis II
   (a) Limits, derivatives, analytic functions
   (b) Calculus of Residues
   (c) Taylor and Laurent Series