PHY 494 Final: The 201 Module

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The 201 Module

Basically, this project will create a coded module for PHY 201 that can solve a majority of the types of problems given in the class.

Given that the class does a lot of proofs and more general problems, the module will aim to only solve the concrete examples given to students.

Topics Covered (if possible to code)

- Complex Arithmetic
- First Order Differential Equations
- Second Order Differential Equations
- Vector Algebra and Matrices
- Orthogonal Functions and Fourier Series
- The One Dimensional Wave Equation

Topics within Topics

Several of the topics mentioned have multiple concepts within them.

- Complex Arithmetic
  - Complex Addition/Subtraction and Multiplication/Division
  - Complex Conjugates, Roots, and conversions to Polar Form
- Vector Algebra and Matrices
  - Vector Notation (ie. δ and ε problems)
- FODE
  - Scale Invariance
  - Exact Differentials
  - Integrating Factor

Objectives

This project will also contain several objectives to be achieved, upon completing the code.

- Transfer all possible mathematical processes from the course into functioning code
- Solve a wide array of problems from HW, requiring the code to be written generally
- When implemented on the PHY201 exam, give mostly correct answers for a good grade
- Be written as simply as possible to teach 201 students math and code simultaneously
- If allowed, be licensed and sold to 201 students as a course supplement for a profit (only joking, unless of course that would be allowed, then totally serious)