OPTI 512L Syllabus:

The Optics 512L laboratory will facilitate your fundamental, mathematical understanding of optics and teach you how to apply your knowledge using computer models and simulations. This course will require a lot of one-on-one quality time with a computer running Matlab. Each week we will cover a new topic class. You will then be required to review the notes and complete the assignment by the following week. The lab writeups for this course need to be clear and understandable but they need not full lab reports with references. Each student must complete their own work. However group discussions of problems and difficulties is encouraged.

Grading

Each lab writeup will count equally towards your grade. There will be no final for this course. Lab due dates will be posted on each lab. Late labs will be penalized 10 points (one grade) for each week late.

Lab Reports

Please submit a written lab report for each lab. This report should contain the necessary code, graphs, and text to show that you understood the problems and the solutions. Please do not just zip up your Matlab files and email them in. You should label all axes when possible and comment your code so that the TA can accurately grade the assignments. Do not forget to discuss your results for each problem so that we know you understood the problems. Email your completed assignments in PDF or Word format directly to the TA.

Topics

- Introduction to Matlab
- Numerical Methods
- Discrete Fourier Transform I
- Discrete Fourier Transform II
- Wave Propagation
- Thin Lens Propoagation
- Image Processing
- Statistics and Distributions
- Monte Carlo Calculations
- Singular Value Decomposition I
- Singular Value Decomposition II
- Radon Transformation
- Image Restoration
- Wavelets