
ECE 4300, Fall Semester 2016
Lasers and Optoelectronics
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Assignment 4

Present your solutions *neatly*. Do not turn in rough unreadable worksheets - learn to **take pride in your presentation**. Show the relevant steps, so that partial points can be awarded. BOX your final answers where applicable. Draw figures wherever necessary. **Please print out the question sheet(s) and staple to the top of your homework.** Write your name, email address, and date/time the assignment is turned in on the cover.

Note: Assignment 1 has additional directions on deadlines, and rules for collaborative work.

Posted on: Wednesday, 10/14/2016. Due on: 10/26/2016, Wednesday

Problem 4.1 (Get familiar with Laser Parameters)

Verdeyen Problem # 8.7.

Problem 4.2 (Continuous-Wave or CW vs Pulsed Lasers)

Verdeyen Problem # 8.11.

Problem 4.3 (Method to Measure the Saturation Intensity)

Verdeyen Problem # 8.12.

Problem 4.4 (Laser Properties)

Verdeyen Problem # 8.16. The wavelength is $\lambda = 0.55\mu\text{m} = 550\text{ nm}$, not 0.55 nm.

Problem 4.5 (Spectral Narrowing in Amplified Spontaneous Emission)

Verdeyen Problem # 8.20. Make the plot vs the Gain in dB.

Problem 4.6 (Gaussian Beam Laser Oscillator)

Verdeyen Problem # 8.21.

Problem 4.7 (Rate Equations, Optical Transparency)

Verdeyen Problem # 8.35.

Problem 4.8 (Quantum Efficiency and Laser Parameters)

Verdeyen Problem # 9.1.