

# PEP 578 Laser Applications and Advanced Optics

Department of Physics and Engineering Physics

Stevens Institute of Technology

Semester: Fall 2016

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**Schedule: Monday 6:15-8:45pm, Buchard 514**

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**Instructor: Prof. Christopher Search**

**Email:** csearch@stevens.edu

**Office:** Burchard 609

**Office Hours:** Mondays 3-5pm or by appointment.

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## Required Textbook

*Fundamentals of Photonics 2<sup>nd</sup> ed.*, B. E. A. Saleh and M. C. Teich (Wiley, 2007)

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## Grading Procedure

Grades are calculated from a weighted average of homework and exams. The various components of your grades have the following weights:

Take Home Final Exam.....	22%
Take Home Midterm Exam.....	22%
Homework (11 of them).....	44%
Lecture Participation.....	2%
Final Paper.....	10%

Homework will be assigned weekly and will consist of 2-4 problems from the textbook. Each HW problem will be graded on a scale of 0-10 (0=no attempt made; 10=100% correct). I will drop the lowest HW score and only use the best 10 of 11 for the final grade.

The final paper is a minimum 4 page typed (1.5 spacing with 12 point font) paper describing a particular area of optical technology related to the topics covered in this course. The paper should explain the physics of the technology. It should also address issues such as fabrication/production and how the technology is used commercially and/or in research and for what applications. (Note: Figures and diagrams are not part of the minimum 4 page length.)

Final letter grades will be calculated based on the following distribution:

<u>Letter Grade:</u>	<u>% Grade:</u>
A	90-100%
A-	85-89.9%
B+/B/B-	70-84.9%
C+/C/C-	50-69.9%
D+/D/D-	30-49.9%
F	<30%

## Lecture Schedule

Week	Textbook Chapter	Topics
1	6	Polarization Optics pt. 1
2	6	Polarization Optics pt. 2
3	7	Photonic crystals
4	8	Guided wave optics
5	8	Guided wave optics
6	9	Fiber optics pt. 1
7	9	Fiber optics pt. 2
8	19	Acousto-optics
9	20	Electro-optics pt. 1
10	20	Electro-optics pt. 2
11	21	Nonlinear optics pt. 1
12	21	Nonlinear optics pt. 2
13	21	Nonlinear optics pt. 3
14	22	Ultrafast optics

**Canvas:** Powerpoint slides and HW solutions will be posted on Canvas. Canvas will also be used for any important course related announcements.

**Midterm and Final Exams:** Both exams will be take home exams. They will be made available to download on Canvas on Saturday afternoon and will be due *at the beginning of class 6:15pm* the following Monday. You will have at least 48 hours to work on each exam. The midterm exam will tentatively occur October 22-24. The final exam will be December 3-5.

**Makeup Class:** In the event that a class has to be canceled due to weather or other reason, there will be a makeup class during the scheduled final exam time for the course in December. The take home final exam will also be rescheduled to be due at the beginning of the makeup class.