

UNIVERSITY OF MASSACHUSETTS LOWELL
Electro-optics and Integrated Optics (ECE 16.468/568)
Spring, 2014

Instructor: Prof. Xuejun Lu

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Course Website: <http://faculty.uml.edu/xlu/16.568/index.htm>

Office Hours: MW 11:00 am– 12pm

Text: *Photonics, 6th edition*, by A. Yariv, Oxford, ISBN-13:978-0-19-517946-0

Reference: *Integrated Optics 5th edition* by Robert G. Hunsperger, Springer.

Course contents:

- Brief introduction of Physical optics, wave propagation, interference, diffraction, and polarization
- Integrated optics and integrated electrical circuits
- Guide-wave optics: 2D and 3D optical waveguide, optical fiber, mode dispersion, group velocity and group velocity dispersion.
- Mode-coupling theory, Mach-zehnder interferometer, Directional coupler, taps and WDM coupler.
- Passive and active optical waveguide devices
- Electro-optics, index tensor, electro-optic effect in crystal, electro-optic coefficient
- Electro-optical modulators
- Photonic switches and all optical switches
- Fiber Optical amplifiers and semiconductor optical amplifiers
- Opto-electronic integrated circuits (OEIC)

Grading Policy:

- Home work: 20%
- midterm exam (take home): 30%
- Final (take home): 40%
- Project (for graduate students) 10%

Course Policy:

- You must attend all exams. Failure to attend will result in a grade of “F”. If you have a “valid” reason for not coming to an exam, you must let the instructor know in advance!
- Make sure to check the class website for updates!
- Homework will be handed out in class each week, and will be graded and returned the following week with solutions.

Project: (graduate students)

Write a review paper on a topic you are interested in with reference citation support.