

Electro-Optics

Course coordinator: Yoonchan Jeong

(Office: 301-1105, Tel: 02 880 1623, Email: yunchan@snu.ac.kr)

Teaching assistant: TBA

Venue & time: 301-302, 15:30 – 18:00, Tue

Office hours: 18:00 – 19:00, Tue

Prerequisites (“*Compulsory*”): Electromagnetics, Quantum Mechanics

Credit points: 3

Course overview:

The objective of this course is to provide postgraduate students with a fundamental and advanced knowledge of the behaviour of electromagnetic waves in various optical media. Topics to be covered include: Propagation of Laser Beams, Polarization of Light Waves, Electromagnetic Propagation in Anisotropic Media, Jones Calculus and its Application to Birefringent Optical Systems, Electromagnetic Propagation in Periodic Media, Electro-optics, Electro-optic Devices, Theory of Lasers and Noise in Optical Detection and Generation.

Note: This course is NOT suitable for students who have not successfully completed the prerequisites!

Course-book:

A. Yariv and P. Yeh, *Optical Waves in Crystals*, John Wiley, 2003.

A. Yariv, *Optical Electronics*, 4th ed. Saunders, 1991.

Course schedule:

Week 1: Introduction & Small-group meeting

Week 2: Propagation of laser beams

Week 3: Polarization of light waves

Week 4: Electromagnetic propagation in anisotropic media

Week 5: Electromagnetic propagation in anisotropic media

Week 6: Summary / Exam 1

Week 7: Jones calculus and its application to birefringent optical systems

Week 8: Jones calculus and its application to birefringent optical systems / Electromagnetic propagation in periodic media

Week 9: Electromagnetic propagation in periodic media

Week 10: Electro-optics & Electro-optic devices

Week 11: Summary / Exam 2

Week 12: Theory of lasers

Week 13: Theory of lasers

Week 14: Noise in optical detection and generation

Week 15: Noise in optical detection and generation / Summary / Exam 3

Evaluation:

Attendance, participation & assignment (20%), exam 1 (30%), exam 2 (30%), exam 3 (20%)