

ECE 452 Electromagnetic Waves and Electro-Optics**Prof. Yurii Vlasov**

Fall 2017 Tentative Schedule (Approximate)

12:30 – 13:50 TR 3081 Electrical and Computer Eng. Bldg.

Tuesday (12:30 – 13:50) ECEB 3081	Thursday (12:30 – 13:50) ECEB 3081
8/29 L1. Introduction, Maxwell's equations. Boundary conditions (§2.1)	8/31 L2. Time-harmonic fields and duality principle, Poynting's theorem (§5.1, §5.2)
9/5 L3. Plane wave solutions (§5.3). Propagation in isotropic media (§5.4)	9/7 L4. Wave propagation in lossy media (§5.5) (HW1 Due)
9/12 L5. Plane wave reflection from a surface. Brewster angle, critical angle (§5.6)	9/14 L6. Matrix optics (§5.7) (HW2 Due)
9/19 L7. Propagation-matrix approach (§5.8)	9/21 L8. Multilayered and periodic media (§5.8-5.9) (HW3 Due)
9/26 L9. Light propagation in uniaxial media (§6.1)	9/28 L10. Ordinary and extraordinary waves (§6.1) (HW4 Due)
10/3 Exam I	10/5 L11. Polaroid and quarter-wave plate (§6.1) Metallic waveguides (class notes)
10/10 L12. Symmetric dielectric waveguides TE modes (§7.1)	10/12 L13. Propagation constant and effective index, Optical confinement factor (§7.1) (HW5 Due)
10/17 L14. TM modes, Cutoff conditions, dispersion relation (§7.1)	10/19 L15. Asymmetric dielectric waveguides (§7.2), Ray optics approach (§7.3) (HW6 Due)
10/24 L16. Surface plasmon waveguides (§7.7)	10/26 L17 Waveguide couplers (§8.1) (HW7 Due)
10/31 L18. Coupled optical waveguides (§8.2)	11/2 L19. Applications of optical waveguide couplers (§8.3) (HW8 Due)
11/7 Exam II	11/9 L20. Optical ring resonators and add-drop filters (§8.4)
11/14 L21. Optical fibers, numerical aperture (Class notes)	11/16 L22. Attenuation in optical fibers (Class notes) (HW9 Due)
11/21 L23. Thanksgiving Break	11/23 Thanksgiving Break
11/28 L23. Signal distortion in optical waveguides, group delay, dispersions (Class notes)	11/30 L24. Electro-optical effects and Amplitude modulators (§13.1) (HW10 Due)
12/5 L25. Transverse amplitude modulator (§13.1)	12/7 L26. Phase modulators (§13.2) (HW11 Due)
12/12 L27. Electro-optical effects in waveguide devices (§13.3)	12/14 Reading day (no class)
12/19 Final Exam week: Final exam date TBA	

All section numbers refer to the text: S. L. Chuang, Physics of Photonic Devices, 2nd edition.