

Tentative Schedule

Week	Topic	Reading Assignment	Additional Reading (EE 230)	Homework
Lecture-6	1-2 Introduction Electromagnetic Optics - Wave Nature of Light <ul style="list-style-type: none"> • Light waves in a homogeneous medium • Refractive Index • Group velocity and group index • Magnetic field, irradiance, and Poynting vector • Snell's Law and TIR • Fresnel Equations 	Kasap 1.1, 1.2, 1.3, 1.4, 1.5, 1.6		
	3-4 Resonator Optics- Multiple Interference and Optical Resonators <ul style="list-style-type: none"> • Resonator Modes • Finesse, spectral width, loss, & photon lifetime • The resonator as a spectrum analyzer More on EM Optics <ul style="list-style-type: none"> • Goos-Hanchen shift and optical tunneling • Temporal and spatial coherence • Diffraction principles 	Kasap 1.6, 1.7, 1.8, 1.9, 1.10, 1.11,1.12		HW #1
	5 Dielectric Waveguides and Optical Fibers <ul style="list-style-type: none"> • Slab Waveguide, Modes, V-Number • Modal, Material, and Waveguide Dispersions • Numerical Aperture, Coupling Loss • Step-Index Fiber, Multimode and Single Mode Fibers 	Kasap 2.1,2.2, 2.3, 2.4, 2.5	Agrawal 2.1,2.2,2.3	HW #2
	6 <ul style="list-style-type: none"> • Bit-Rate, dispersion and optical bandwidth • Graded-index fibers • Absorption and Scattering Photons and Atoms: <ul style="list-style-type: none"> • The photon • Atoms, Molecules, and solids • Interaction of Photons with atoms Midterm #1	Kasap 2.6,2.7, 2.8, 2.9, 3.1, 3.2	Agrawal 2.3,2.4,2.5,2.6,2.7	

NOTE: WEEK-1 starts on September 27 2018

Lecture-6

Lecture-13

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Week	Topic	Reading Assignment	Additional Reading (EE 230)	Homework
Lecture-15	7 Semiconductor Science and Light Emitting Diodes <ul style="list-style-type: none"> • Semiconductor concepts and energy bands • Direct and indirect bandgap semiconductors- pn junction principles • The pn junction band diagram • Light-emission processes in semiconductors • Light-emitting diodes (LEDs) 	Kasap 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 3.10, 3.11, 3.12, 3.13, 3.14, 3.15	Agrawal 3.1, 3.2	HW #3
	8 Stimulated Emission Devices Lasers <ul style="list-style-type: none"> • Stimulated emission and light amplification • Einstein coefficients • Optical fiber amplifiers • Gas laser and He-Ne Laser • The output spectrum of a gas laser 	Kasap 4.1, 4.2, 4.3, 4.4, 4.5	Agrawal 3.3, 3.4, 3.5	
	9 Lasers <ul style="list-style-type: none"> • Laser oscillation conditions • Semiconductor lasers, (laser diodes) • Rate equation • Light emitters for optical fiber communications 	Kasap, 4.6, 4.7, 4.10, 4.11, 4.12, 4.13, 4.14, 4.15, 4.16	Agrawal 3.3, 3.4, 3.5	HW #4
Lecture-18	10 FINAL EXAM December 11 (8-11:00 AM)			