Course Name
Statistical Optics

Lecturer
Prof. Moshe Tur

Semester
First semester

Course requirements
Undergraduate courses in Optics and Random signals and noise (0512.3632 or equivalent)

Final grade based on:
Final project

Structure of the Course

Plans of Lectures	Paragraphs in Goodman's Statistical Optics
Statistical Optics, the electromagnetic field and its moments.	
First order properties:	
The analytic signal	3.8
The statistics of a polarized and unpolarized thermal source	4.2
The coherency matrix and partial polarization (including Stokes and Jones representations) and thermal light	4.3-4.4
Second order moments:	
Temporal coherence, the autocorrelation function, optical spectra and OCT	5.1
Spatial coherence and its propagation, the Mutual Coherence Function	5.2, 5.4
Van-Cittert-Zernike theorem and stellar interferometry	5.6
Higher order moments:	
Intensity fluctuations and laser phase noise	Handouts
Light propagation through turbulence	Handout (8.1-6)
Speckles	7.7
Photoelectric detection of light	9.1-9.2

Literature: (*Handouts, containing the lecture material will be distributed*)
1. J.W. Goodman, *Statistical Optics,* 1st and 2nd editions, Wiley (available ONLINE from TAU Exact Sciences Library) [Most material is covered by this book]
2. B.E.A. Saleh and M.C. Teich, *Photonics*, 1st or 2nd editions, Wiley [Some material]