



# Full Syllabus



## Course Title

Quantum Electronics

## Lecturer

Alon Bahabad

## Semester

A

## Course requirements

Undergrad course in quantum mechanics

## Final grade components

Exam

## Course schedule

Class no. / Date	Subject and Requirements (assignments, reading materials, tasks, etc.)
1	The TDSE and its solution for a time-independent Hamiltonian
2	Mathematical foundation of QM
3	Observable, measurements, uncertainly principle, commuting observables
4	Schrodinger and Heisenberg representations, the simple harmonic oscillator (SHO)
5	Semiclassical quantum optics including Fermi's golden rule and Rabi oscillations
6	Recitation I
7	Quantization of the electromagnetic field
8	Fully quantum description of light-matter interaction
9	Intensity operator, classical sources of light
10	Simple manipulation of quantized light , The HOM experiment
11	Entanglement and the EPR paradox, Bell's inequalities
12	Quantum description of the complex envelope of the EM field
13	Recitation II

## Required course reading

C. Gerry and P. Knight, Introductory quantum optics, Cambridge University Press, 2005.

## Optional course reading

1. C. Cohen-Tanoudji, B. Diu and F. Laloe Quantum Mechanics, vol. 1, Wiley, NY, 1977.
2. R. Loudon, The quantum theory of light, 3rd edition, Oxford Science Publications, 2000.

## Comments