Course Description

Electromagnetism(1), (2), (3)
These courses introduce students to classical electrodynamics at the advanced level. The major topics covered in these courses include Maxwell equations, electromagnetic waves, wave guides, transmission lines, scattering and diffraction, special relativity, and radiation.
Quantum Electronics(1), (2), (3)
These courses introduce to quantization of electromagnetic waves, transfer of optical beams, laser cavities, interaction between light and atomic systems, laser oscillation, Q-switching, mode-locking, laser amplification etc.
Nonlinear Optics(1), (2), (3)
In these courses, we study the nonlinear optical effects of high-harmonic generation, sum or difference frequency generation, optical parametric oscillation and amplification, stimulated Raman scattering, 4-photon degeneration, self-focusing, and so on.
Laser Spectroscopy(1), (2)
These courses cover properties of light, interaction between light and matter, properties of laser radiation, laser systems for spectroscopy, principles of various spectroscopic methods and related instrumentations.
Applied Optics Experiment(1), (2)
These courses help students to apply the various fields of optics through various experiments, for example, laser-diode pumped solid-state laser, second-harmonic generation for RGB light source, laser development for medical treatments and science studies, and so on.
Special Topics in Optics(1), (2)
These courses cover important topics in recent optical science or industries related to various optical disciplines like geometrical optics, physical optics, or laser optics, and the like.
Design of Optical System(1), (2), (3)
Fundamentals of Geometrical Optics, Geometrical Theory of Image Formation, Radiometry, Aberrations, Optical System Layout, Topics covered in the lectures will include: foundations of geometrical optics, Gaussian Optics, geometrical theory of image formation, basic optical devices and instruments, radiometry and flux transfer in imaging systems, introduction to aberration theory, image evaluation/analysis.

Optical Design Exercise(1), (2)
Design principles of optical systems; evaluation of designs using computer techniques. The lectures include methods of lens design, optimization, achomatization methods, Petzval curvature, 3rd order optical aberrations,and image quality metrics.
Optoelectronics(1), (2)
This course is an advanced course in optoelectronics and measurement techniques widely used in experiments for optical engineering students. The operation principles and the characteristics of optical communication, optical measurements and optical information with their applications are studied.
Optical Materials(1), (2)
This course is an advanced course in optical materials. Basics of physics and chemistry will be applied to understand the properties of optical materials. Thermal, mechanical, electrical and optical properties of materials will be studied to apply to optical design.