**SYLLABUS – NS 214- Oscillations, Waves and Optics**

**Course Content:**

**Oscillations, Waves and Optics** Linear oscillators. Coupled oscillators and normal modes with mechanical and electromagnetic examples. Inertia, restoring force and damping. Driven systems and resonance. The continuum limit. Waves and wave equations. Dispersion relations. Phase. Interference and diffraction. Wave packets. Impedance, reflection, absorption and transmission. Polarization. Geometrical optics. Brief introduction to nonlinearity.

**Salınımlar, Dalgalar ve Optik** Çizgisel osilatörler. Birbirine bağlı osilatör sistemleri, mekanik ve elektromanyetik örnekleri ile normal titreşim kipleri. Eylemsizlik, geri getirme kuvveti ve sönüm. Uyarılan sistemler ve rezonans. Sürekli ortam. Dalgalar ve dalga denklemi. Faz. Girişim ve kırınım. Dalga paketleri. Empedans, yansıma, soğurma ve geçirme. Polarizasyon. Geometrik optik. Çizgisel olmayan sistemlere kısa giriş.

**Textbook:**
King, George C., "Vibrations and Waves"
**Recommended reading:**
Crawford Jr., F.S., "Waves" – Berkeley Physics Course Vol. III

**Learning Outcomes** Upon completing this course students should be able to formulate and solve free or driven oscillator equations, using sinusoidal or complex exponential functions; be able to give simple examples of resonance and damping. They should be able to recognize and solve wave equations, obtain the dispersion relation from a given wave equation, understand propagation in different media, reflection and transmission. They should understand the meaning of phase and solve simple interference and diffraction problems.

**Grading Policies**

| | **Percent** | **Number of** |
|---|---|---|
| Final | 25 % | |
| Midterm | 50 % | 2 |
| Participation | 25 % | |