**Course Title:** Waves and Optics  
**Course Code:** PHYS 211  
**Level:** B.Sc. (Applied Physics)  
**Cr. Hrs:** 3  
**Year:** II  
**Semester:** II

**Course Objectives:** This course is divided into two parts. The first part studies the idea of development of wave phenomenon, development of wave equation, oscillatory motion, properties and applications of ultrasonics, Musical Sound and Acoustic of Buildings while the second optics part discuses the phenomenon of interference and different types of interferometer, Fresnel and Fraunhofer diffraction, diffraction grating, resolving power of grating, microscopes and telescopes, concept of polarization, production and detection of polarized light, aberrations in lenses and eye pieces.


3. **Lissajous’ Figures:** Lissajous figures. Composition of two rectangular simple harmonic motions of same frequencies (or period). Frequency ratio 2:1. Demonstration of Lissajous figures. [4 Hrs]


7. **Interference:** Basic concepts of interference. Fresnel’s biprism. Lloyd’s mirror. Michelson interferometer. Fabry-Perot interferometer. Wedge shape interferometer. [5 Hrs]

8. **Diffraction:** Fresnel and Fraunhofer diffraction. Zone plate. Diffraction through single and double slits. Plane diffraction grating. Dispersive and resolving power of grating. Microscopes and Telescopes. [6 Hrs]

9. **Polarization:** Basic concept of polarization. Double refraction. Nicol prism as polarizer and analyzer. Quarter wave plate and half wave plate. Production and detection of plane, elliptically and circularly polarized light. Specific rotating power; Laurentz’s half shade polarimeter. [6 Hrs]
Text Books

1. Ajoy K. Ghatak, Optics. Tata Mc-Graw Hill,India
2. Suresh Garg etal, Oscillation and Waves. PHI Learning India
3. Dev Raj Singh, Fundamental of Optics. PHI Learning India
5. N.Subrahmanyam etal, Text Book of Optics. S.Chand

References

1. N. K. Bajaj, Waves and Oscillations. Tata Mc-Graw Hill, India
2. Hecht, Optics 4e. Pearson
4. S. P. Singh and J. P. Agarwal, Optics. Pragati