1. Subject Code: **EP-312** Course Title: **FOURIER OPTICS AND HOLOGRAPHY**
2. Contact Hours : L : 3 T : 1 P : 0
3. Examination Duration (Hrs.) : Theory : 3 Practical : 0
4. Relative Weight : CWS : 25 PRS : 0 MTE : 25 ETE : 50 PRE : 0
5. Credits : 4
6. Semester : EVEN
7. Subject Area : DEC- 3
8. Pre-requisite : Basic knowledge of Modern Physics, Optics & Quantum Physics
9. Objective : * Information processing using optical techniques such as holography and Fourier transform is an important area of Modern Optics. In this course the fundamentals, techniques and applications of holography and Fourier optics will be provided.
10. Details of Course:

S.No.	Contents	Contact Hours
1.	Signals and systems, Fourier Transform(FT), Sampling theorem, Diffraction theory; Fresnel-Kirchhoff formulation and angular spectrum method	9
2.	brief discussion of Fresnel and Fraunhofer diffraction, FT properties of lenses and image formation by a lens; Frequency response of a diffraction-limited system under coherent and incoherent illumination	11
3.	OTF-effects of aberration and apodization, comparison of coherent and incoherent imaging, super-resolution; Techniques for measurement of OTF; Analog optical information processing: Abbe-Porter experiement, phase contrast microscopy and other simple applications; Coherent image processing:	9
4.	VanderLugt filter; joint-transform correlator; pattern recognition, Synthetic Aperture Radar.	8
5.	Basics of holography, in-line and off-axis holography; 3 12 Transmission and reflection holograms, Amplitude and phase holograms, Recording materials. Thick and thin holograms	5
	Total	**42**

11.Suggested Books

S.No.	Name of Books/ Authors	Year of Publication/ Reprint
1.	Introduction to Fourier Optics by J.W.Goodman/Mc Graw Hill	1996
2.	Optical Holography, Principles, Techniques and Applications by Hariharan/ Cambridge Univ.Press	1996
3.	The Fourier Transforms and its applications by R.N.Bracewell/Mc Graw Hill	1965
4.	Linear systems, Fourier Transforms and optics by Gaskill.J/ Wiley	1978
5.	Fundamentals of Holography by Denisyuk, Y/ MIR Publisher	1984
6.	An Optical holography by R.J.Collier / Academic Press	1971