

SARASWATI MAHILA MAHAVIDHYALAYA, PALWAL

LESSON-PLAN

Class: B.Sc-IIIrd Year (NM2CS) : PHYSICS

Semester: ODD/EVEN

Subject: OPTICS - I

Session: 2020-21

Lecture Number	Topic
1.	Unit-III : Interference by division of wavefront. Introduction of Basics of Interference, wavefront, coherent & monochromatic source
2.	Young's double slit Experiment ; Path & phase change & difference.
3	Analytical treatment of interference, Expression for bright & dark fringe width.
4	Freshel's Biprism : Experimental setup, measurements, fringe width calculations.
5	Determination of thickness of thin sheet of transparent material derivation
6	Lloyd mirror : Experimental setup, measurements & calculations.
7	Difference between Freshel's Biprism & Lloyd's mirror; Stokes's law (law of reversibility) Basics.
8	Stokes's law (continued), Numericals.
9	Revision of Unit III ; Assignment Questions ; Discussion.
10	Unit-II : Geometrical Optics Introduction of matrix, types of matrix, formation of matrix, Rules of matrix
11	Introduction of Basics of Refraction & Sign Conventions ; Coordinates of a Paraxial Ray.
12	Effect of translation & translation matrix.
13	Effect of Refraction & refraction matrix.
14	Position of the image plane and magnification By a spherical Refracting Surface
15	Position of the image plane and magnification of the optical system.
16	Derivation of lens formula for thin & thick lens.
17	Unit planes : derivation

Nisha Pagar
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Lecture Number	Topic
18	Nodal Planes! derivation
19	Derivation of lens equation
20	System of two thin lenses and numericals
21	Introduction to ABerrations and its types; Expression for longitudinal Chromatic Aberration for an object at infinity.
22	Expression for longitudinal Chromatic Aberration for an object at a finite distance.
23	Achromatic doublet; Achromatic combination of thin lenses in contact
24	Achromatic combination of two Co-axial lenses at a finite distance apart
25	Achromatic doublet with minimum spherical aberration.
26	Monochromatic aberrations. → spherical aberration
27	Method of Reducing Spherical aberration.
28	Coma & Elimination of Coma
29	Astigmatism; Removal of Astigmatism.
30	Curvature of field; Removal of Curvature of field!
31	Distortion; Removal of Distortion.
32	Numerical revision of Unit-II.
33	Revision of Unit-II; Assignment; Discussion.
34	Unit-I Fourier analysis & Fourier transform Introduction to transverse vibration of strings

Nisha Pagur

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Lecture Number	Topic
35	Speed of longitudinal wave in a fluid
36	Superposition of waves.
37	Numericals of above topics.
38	Introduction of STM, Sine & Cosine functions; Fourier theorem
39	Fourier theorem & Fourier Series.
40	Dirichlet Conditions; Importance of Fourier theorem.
41	Fourier series of function $f(x)$ in a series of Sine & Cosine between limits $-\pi$ to π .
42	Even and odd functions: Fourier series of an even function in the interval $(-\pi$ to $\pi)$ - Cosine series
43	Fourier series of an odd function in the interval $(-\pi$ to $\pi)$ - Sine series
44	Fourier series of Sine & Cosine in the interval $(0, \pi)$
45	Fourier series of Sine & Cosine in the interval $(0, 2\pi)$
46	Fourier series in any interval $(-L, L)$ where L is any real number.
47	Complex form of Fourier Series
48	Analysis of Rectangular wave or Square wave
49	Analysis of triangular wave
50	Analysis of half & full wave rectifier
51	Fourier Integrals

Nisha Dagar

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Lecture Number	Topic
52	Introduction to fourier transform; fourier sine transform
53	fourier cosine transform
54	Properties of theorems of fourier transform
55	Application of fourier transform: Evaluation of integral.
56	Application of fourier transform: evaluation of differentials ⁿ
57	Revision of Numericals; Discussion
58	Revision of Numericals; Assignment; Discussion,

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