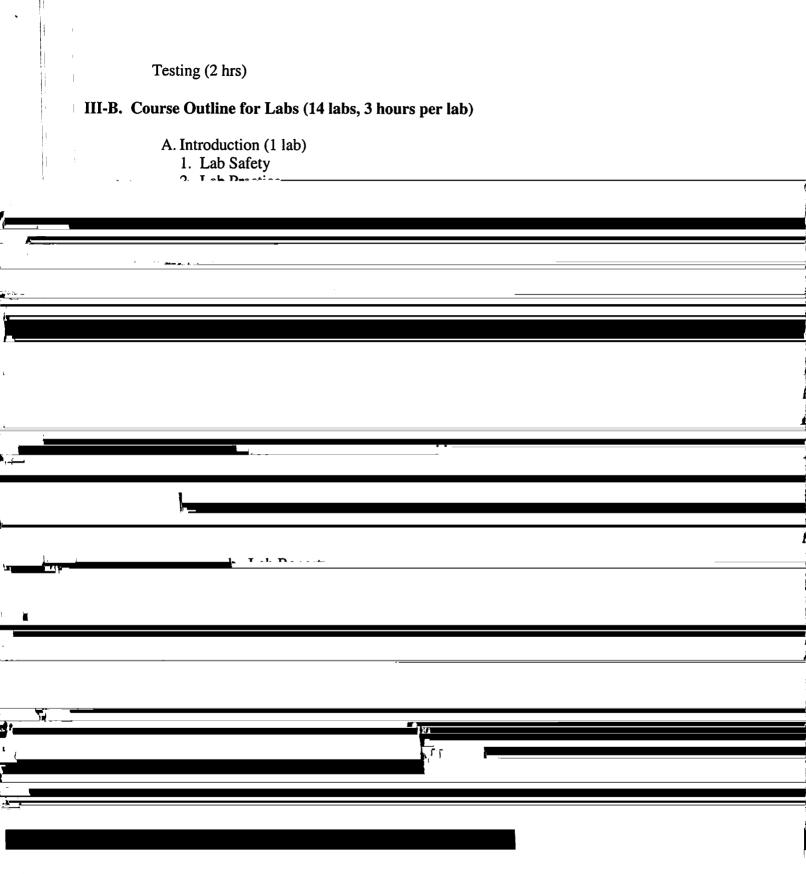


Syllabus of Record for EOPT 110

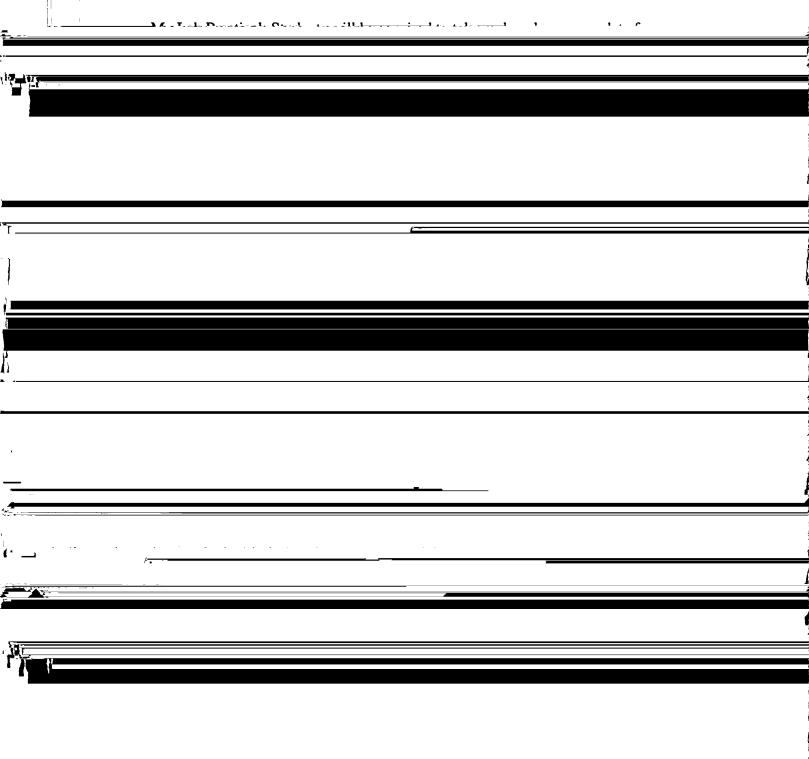
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	,	EOPT 110 Geometric Optics		2 lecture hours	
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- C. Refraction at Plane Surfaces (2 hrs)
 - 1. Law of Refraction and Snell's Law:
 - 2. Total Internal Reflection (TIR).
 - 3. Refraction in a Prism.
 - 4. Color Dispersion.
- D. Prisms (2.5 hrs).
 - 1. Types of Prisms and Terms Relevant to Prisms.
 - 2. Ray Tracing through Prisms.
- E. Refraction at Spherical Surfaces (2 hrs)
 - 1. Concave and Convex Surfaces.
 - 2. Thick Lenses vs. Thin lenses.
- F. Imaging with a Single Lens (3 hrs)
 - 1. Definition of a Thin Lens.
 - 2. Converging Lenses, Diverging Lenses, and Lens Types.
 - 3. Thin Lens Equation.
 - 4. Virtual and Real Images.
 - 5. Lensmaker's Equation.
- G. Imaging with Multiple Lenses (2.5 hrs)
 - 1. Graphical and Analytical Solutions for Multiple lenses.
- H. Optical Systems (3 hrs)
 - 1. The Simple Magnifier.
 - 2. Compound Microscope.
 - 3. The Astronomical Telescope.
 - 4. The Reflecting Telescope.
 - 5. Catadioptric Systems (i.e. those with both mirrors and lenses).
 - 6. Binoculars.
 - 7. Cameras.



with specified refractive index, n, and radius of curvature R, determine the following: a. Angle of refraction of the given light ray, analytically, from Snell's law. screen investigate the aberration due to the spherical shape of the lens.

- 2. Investigate the chromatic aberration of two different lenses.
- 3. Investigate astigmatism of a lens.
- L. F-Stops and Apertures (1 lab)
 - 1. Determine graphically, analytically, and experimentally the exit pupil, entrance pupil, and aperture stop for two lenses with a stop placed between them.



VI. Special resource requirements

None

VII. Bibliography

Booth, K. and Hill, S., *The Essence of Optoelectronics (Essence of Engineering)*, Pearson Ptr., 1998

Fowler, G., Introduction to Modern Optics, Dover, 1989

Jenkins, Francis A. and White, Harvey E., Fundamentals of Optics, 4th Ed., McGraw Hill, New York, 1976

Lipson, H.; Tannhauser, D.; Lipson, S., Optical Physics, 3rd Ed., Cambridge, 1995

Meyer-Arendt, Jurgen; Introduction to Classical and Modern Optics, 4th Ed., Prentice Hall, Englewood Cliffs, New Jersey, 1995

		Prentice Hall, Englewood Cliffs, New Jersey, 1995	
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X X Table 1			

A3 This course has not been offered on a trial basis at IUP. A4 This course is not intended to be dual level. **A5** This course is not to be taken for variable credit. **A6** Similar courses are offered at these institutions: 1. Cincinnati Technical College; Cincinnati, Ohio LOT 6720 Geometrical and Wave Optics Indian Wills Community College, Ottoman I. LE 254V Geometrical and Wave Optics 3. Monroe Community College; Rochester, New York OPT 131 Optical Elements and Ray Optics 4. Pueblo Community College; Pueblo, Colorado PHV 234 Geometric Optics 5. Springfield Technical Community College; Springfield, Massachusetts EL 330 Geometrical Optics 6. Texas State Technical College; Waco, Texas LET 205 Geometrical Optics II 7. Three Rivers Community / Technical College; Norwich, Connecticut PHY 140 Geometric Optics A7 As far as is known, the contents or skills of this proposed course are not recommended or

required by a professional society, accrediting authority, law or other external agency.

C2	Other Resources a. Space It is anticipated that a new building will be constructed at the North Pointe (Slate Lick) site before this program starts in the Fall of 2002. This building will house the Electro-
	Optics program. If the building is not ready by Fall of 2002 the program will be housed
	in the Electro-Optics Center (EOC) located in the West Hills.
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