

*The list of the experimental problems in Optics Laboratory*

<i>Number of Problem</i>	<i>Name of Problem</i>	<i>Exercises</i>
<b><i>Geometrical Optics</i></b>		
411	Tracing Rays through the Simple Optical Elements	Tracing Rays through the thin lenses and determination the focal length.
		Tracing Rays through the rectangular prism
		Tracing Rays through the concave and converge mirrors
		Tracing Rays through plane-parallel plate and determination the refraction index.
412	Determination of the Refraction Index of Solid Bodies by the Microscope.	Determination the sizes and square of small objects
		Determination the refractive index of the glass plate
413	Determination of the Refraction Index and Concentration of Solution by the Refractometer	Measurement of the refractive index of the solution of glycerol and identification of unknown concentration
414	Investigation of Simple Centered Optical System	Determination the focal length of positive lens
		Determination the focal length of positive lens by the Bessel's method
		Determination the focal length of positive lens by autocollimation method
		Determination the focal length of negative lens
		Determination the focal length of lens using collimated light
415	Determination of Cardinal Points of Complex Optical System	Determination of the principle and focal points of optical system consisting from two positive lenses
<b>The Light Propagation in Isotropic Mediums. Dispersion of Light.</b>		
421	Determination of the Refraction Index and Prism Dispersion Using Goniometer (GS)	Determination of the Prism's angle.
		Determination of the Refraction Index and Prism Dispersion
422	Determination of the Refraction Index and Prism Dispersion Using Goniometer (LDidactic)	Determination of the Prism's angle.
		Determination of the Refraction Index and Prism Dispersion
		Determination of the Refraction Index of the

		Liquid
423	Determination of the Velocity of Light in Air and Liquids from the Path and Transit Time of a Short Light Pulse	Assembly and adjustment of settings
		Determination of the Refraction Index of the water and polymer by the Laser distance meter
		Determination of the Refraction Index of the prism
424	Absorption of the Light	Qualitative spectral analysis
		Checking the Bouguer-Lambert-Beer law
		Determination of the solution concentration.
425	Analyses of the Sun Spectrum	The observation of the Fraunhofer lines in the Sun spectrum
		Comparison of the solar spectrum with the emission sodium spectrum
<b>Laws of Radiation and Basic Laws of Photometry</b>		
431	Basic Laws of Photometry	Investigation of the dependence of the illumination on the distance from the source
432	Stefan-Boltzmann Law	Measuring the radiant intensity of a "black body" as a function of temperature
<b>The Light Reflection and Refraction on the Border between two Dielectrics</b>		
441	Fresnel's Laws of Reflection	Assembly and alignment of the optical system
		Investigation of the dependence of the reflection coefficient on the incident angle and polarization of the incident light
		Determination of the refractive index of the glass plate
		Determination of the degree of polarization of the reflected light
<b>Interference</b>		
451	Interference at Fresnel's Biprism with an He-Ne Laser	Adjustment of the optical system
		Determination of the distance between two coherent sources
		Determination the wavelength of the laser
452	Lloyd's Mirror Experiment with an He-Ne Laser	Adjustment of the optical system
		Determination of the distance between two coherent sources
		Determination the wavelength of the laser
453	Newton's Rings	Newton's Rings in transmitted and reflected monochromatic light
		Determination of the curvature radius of the lens

		Determination the wavelength of the sodium lamp radiation
454	Interference of the Spherical Waves	Adjustment of the optical system
		Analysis of the interference pattern at changes of air temperature and the distance between the coherent sources.
		Determination the wavelength of the laser
455	Interference Filters	Determination of the spectral characteristics of the filters (normal incidence)
		The dependence $\lambda_{\max}$ and $\delta\lambda$ vs angle of incidence
456	Investigation of the Spatial Coherence of the extended Light Source	Measurements of the coherence radius of the extended light source
<b>Diffraction</b>		
461	Fraunhofer and Fresnel Diffraction at the Slit	Adjustment of the optical system
		Observation Fraunhofer and Fresnel diffraction.
		Determination the slit width by diffraction pattern
462	Fraunhofer Diffraction at one- and two-dimensional Gratings	Adjustment of the optical system and observation of the diffraction pattern
		Determination the wavelength of the laser
463	Diffraction Gratings	Determination of the distance between the slits
		Determination of the wavelength of the light
		Determination of the angular dispersion and limit of resolution
464	Fresnel Phase Zone Plate	Visual observation of focusing light by ZP.
		Determination of the zone Fresnel radii
		Analysis of the Ne spectrum
465	Ultrasound in Liquid (Debye-Sears Effect)	Optical determination of the velocity of sound in liquids
		Laser diffraction at an ultrasonic wave in liquids
<b>The Propagation of Light through Unisotropic Medium</b>		
471	Malus' Law	Adjustment of the optical system.
		Investigation of the dependence of the light intensity on the angle between the polarizes
472	Investigation of Polarized Light	Adjustment of the optical system
		Determination of Optic axis of the crystal plate

		Investigation of the half-wave plate
		Investigation of the quarter-wave plate
473	Rotation of the Plane of Polarization of Sugar Solution	Measurement of the angle polarization plane rotation upon the wavelength $\lambda$
		Determination of specific rotation of sugar
		Investigation of dependence of specific rotation on wavelength $\lambda$
474	Polarimeter	Verification of the Biot Law
475	Faraday effect	The calibration of the magnetic field
		Investigation of the dependence of the polarization plane angle on the magnetic induction