

Advanced Optics Laboratory

PHY455/555: Syllabus

Date	<u>SUBJECT</u>	Week, Exp #	Group Name	Due Dates Lecture dates
20-Jan & 25-Jan	<u>Course Introduction. Introduction to Lab A: Lab A: Prism Spectrometer</u> <i>The Prism Spectrometer and Dispersion Curve of Glass</i>	Exp1		Lecture 1 (Jan20)
27-Jan	<u>Lab A: Prism Spectrometer</u> <i>The Prism Spectrometer and Dispersion Curve of Glass</i> <u>Introduction to Lab F: Fourier Optics (part 1)</u>	Exp1		Lecture 2 (Jan27)
1-Feb	<u>Presentations. Lab A: Prism Spectrometer</u> <u>Introduction to Lab F: Fourier Optics (part 2)</u>			Lecture 3 (Feb1)
3-Feb	<u>Introduction to Lab B: Autoranging Radiometer</u> <i>Gaussian Wave Optics, Interference and Diffraction</i> <u>Introduction to Lab F: Fourier Optics (part 3)</u> <i>FTIR Spectrometry</i>	Exps2,3 Exp9	$\alpha, \beta, \chi, \delta$ ϵ	Lecture 4 (Feb 3) Notebooks - due on Feb 5
8-Feb & 10-Feb	<u>Lab B: Autoranging Radiometer</u> <i>Gaussian Wave Optics</i> <i>Interference and Diffraction</i> <u>Introduction to Lab F: Fourier Optics (part 4)</u> <i>FTIR Spectrometry</i>	Exp2 Exp3 Exp9	α, β χ, δ ϵ	Lecture 5 (Feb 10)
15-Feb	President's Day (University Holiday)			
17-Feb	<u>Lab B: Autoranging Radiometer</u> <i>Gaussian Wave Optics, Interference and Diffraction</i> <i>FTIR Spectrometry</i>	Exps2,3 Exp9	$\alpha, \beta, \chi, \delta$ ϵ	
22-Feb	<u>Presentations. Lab B: Autoranging Radiometer</u> <u>Lab F: Fourier Optics</u>		$\alpha, \beta, \chi, \delta$ ϵ	
24-Feb	<u>Introduction to Lab C: Michelson Interferometer</u> <i>Experiments #4, #4a, #5, #5a</i> <u>Introduction to Error Analysis</u>	Exps4,5 4a,5a	$\alpha, \beta, \chi, \epsilon$	Lecture 6 Notebooks - due on Feb 26
1-Mar & 3-Mar	<u>Lab C: Michelson Interferometer</u> <i>Index of Refraction of a Gas (Old and New Set ups)</i> <i>Thickness of a Thin Film, Index of Refraction of Glass</i> <i>FTIR Spectrometry</i>	Exps4,4a Exps5,5a Exp9	χ, ϵ α, β δ	Lecture 7 (Mar3)
8-Mar	<u>Lab C: Michelson Interferometer</u> <i>Index of Refraction of a Gas, Thickness of a Thin Film</i> <i>The Index of Refraction of Glass</i> <i>FTIR Spectrometry</i>	Exps4,4a Exps5,5a Exp9	$\alpha, \beta, \chi, \epsilon$ δ	
10-Mar	<u>Presentations. Lab C: Michelson Interferometer; Lab F</u>			Lecture 8

Introduction to Lab D: Fabry-Perot Interferometer

Experiments #6, #7, and #7a

Notebooks - due
on Mar 12

15-Mar & 17-Mar	Spring Break Week			
22-Mar & 24-Mar	Lab D: Fabry-Perot Interferometer <i>The Anomalous Zeeman Splitting of the Sodium 3P States</i> <i>The Separation of the Mercury Yellow Doublet</i> <i>Measuring the Wavelength of the Laser Light (New Set Up)</i> FTIR Spectrometry	Exp6 Exp7 Exp7a Exp9	α, δ β, ϵ β, ϵ χ	Lecture 9(Mar22)
29-Mar	Lab D: Fabry-Perot Interferometer <i>Experiments #6, #7, and #7a</i> FTIR Spectrometry	Exps6,7 Exp9	$\alpha, \beta, \delta, \epsilon$ χ	
31-Mar	Presentations. Lab D: Fabry-Perot Interferometer; Lab F Introduction to Lab E: Scanning Grating Monochromator			Lecture 10 Notebooks - due on Apr 2
5-Apr	Lab E: The Scanning Grating Monochromator <i>The Emission Spectrum of Mercury</i> FTIR Spectrometry	Exp8 Exp9	$\alpha, \chi, \delta, \epsilon$ β	
7-Apr & 12-Apr	Lab E: The Scanning Grating Monochromator <i>The Emission Spectrum of Mercury</i> FTIR Spectrometry	Exp8 Exp9	$\alpha, \chi, \delta, \epsilon$ β	Lecture 11 (Apr 7)
14-Apr	Presentations. Lab E: Grating Monochromator. Lab F <i>The Emission Spectrum of Mercury</i> Starting Grand Lab Projects		$\alpha, \beta, \chi, \delta, \epsilon$	Lecture 12 Notebooks - due on Apr 16
19-Apr & 21-Apr	Grand Lab Projects Lab F: Fourier Transform Infrared Spectrometry and finishing Labs B, C, D, E		α $\beta, \chi, \delta, \epsilon$	
26-Apr	Grand Project Presentations of Labs B,C,D,E,F Starting Open Lab Experiment			
28-Apr	Open Lab Experiment: <i>Two Slit Interference: One Photon at a Time</i> <i>X-ray Optics, Holography, Dynamic Light Scattering</i> <i>Static Light Scattering, Depolarized Scattering, TBA</i>		$\alpha, \beta, \chi, \delta, \epsilon$	Notebooks - due on Apr 30
3-May & 5-May	Open Lab Experiment: <i>Two Slit Interference: One Photon at a Time</i> <i>X-ray Optics, Holography, Dynamic Light Scattering</i> <i>Static Light Scattering, Depolarized Scattering, TBA</i>		$\alpha, \beta, \chi, \delta, \epsilon$	
12-May	Open Lab Presentations ($\alpha, \beta, \chi, \delta, \epsilon$) Concluding Remarks			Open Lab Reports are due on May 14