






The purpose of this task list is to facilitate your learning of Python and Polarization Fundamentals, as well as develop your skills in writing and presenting. *These tasks are self-paced for the semester, but I recommend approx 1-2 weeks for each task.* The tasks will be in addition to coming into the lab and having hands-on learning.

Textbook: [Polarized Light and Optical Systems by Chipman et. al.](#)

Overall Goal	Task and Subtasks	Extra Resources
Familiarity with polarization Presentation	1. Polarization - Intro <ul style="list-style-type: none"> <input type="checkbox"/> Read Patterns and Properties of Polarized Light Cronin et. al (https://www.jstor.org/stable/41061764) <input type="checkbox"/> Read the Sec 2.1-2.15 of the textbook <input type="checkbox"/> Summarize takeaways in a slideshow <ul style="list-style-type: none"> ○ Answer the questions: <ul style="list-style-type: none"> ■ What is polarization? ■ How does it behave in nature? <input type="checkbox"/> Present or send to Clarissa 	 Spectra Interferen...
Familiarity with linear algebra and python Coding	2. Getting Started with Python <ul style="list-style-type: none"> <input type="checkbox"/> Download Anaconda (https://www.anaconda.com/download) <input type="checkbox"/> Follow the tutorial to write your first Python code in Spyder. Opening Spyder <input type="checkbox"/> Write a Python code in Spyder to multiply two matrices together. <input type="checkbox"/> Send Code to Clarissa 	https://www.mathsisfun.com/algebra/matrix-multiplying.html  Matrix multiplicat...
Presentation Polarization Fundamentals	3. Polarization - Stokes Parameters <ul style="list-style-type: none"> <input type="checkbox"/> Read Sec. 3.1-3.9 of the textbook <input type="checkbox"/> Summarize takeaways in a slideshow <ul style="list-style-type: none"> ○ Answer the question(s): <ul style="list-style-type: none"> ■ What are the Stokes Parameters? ■ What is AoP/DoP? <input type="checkbox"/> Present or send to Clarissa 	 Linear combinatio...
Python	4. Python #2 <ul style="list-style-type: none"> <input type="checkbox"/> Write a Python code to calculate AoP and DoP from Stokes parameters <input type="checkbox"/> Send Code to Clarissa 	Sec 4.2 of this paper: https://www.overleaf.com/read/vjyqbmjpvniq#cf3c94

Polarization Fundamentals	<p>5. Polarization - Rayleigh Sky Model</p> <ul style="list-style-type: none"> <input type="checkbox"/> Watch this video: <ul style="list-style-type: none">  RAYLEIGH AND MIE SCATTERING <input type="checkbox"/> Read this wiki: <ul style="list-style-type: none"> https://www.polarization.com/sky/sky.html <input type="checkbox"/> Make slideshow <ul style="list-style-type: none"> ○ Answer the questions: <ul style="list-style-type: none"> ■ Why is the sky blue? ■ Why are clouds white? ■ When does Rayleigh scattering dominate? When does Mie? ■ For a clear sky day (no clouds) what is the polarization pattern of the sky around the sun? <input type="checkbox"/> Send or present slideshow to Clarissa 	https://user.engineering.uiowa.edu/~ece195/2006/docs/Rayleigh.pdf
All Hands Meeting!! - Email Clarissa that you are ready to have a meeting with all of us		
Start of collaborative poster project. You two will work together to create a poster outlining what polarization is, and 6 different polarization phenomena.		
Writing Polarization Fundamentals	<p>6. Overleaf</p> <ul style="list-style-type: none"> <input type="checkbox"/> Make an Overleaf account: overleaf.com <input type="checkbox"/> Start a document and make sure both of y'all can edit it <input type="checkbox"/> Title it "Polarization Phenomena" <input type="checkbox"/> Identify 6 polarization phenomena (3 each) <input type="checkbox"/> Send to Clarissa for approval 	 Writing a basic La... https://www.overleaf.com/learn/how-to/Sharing_a_project Examples: Brewster's Angle Calcite Neutral Points
Writing Polarization Fundamentals	<p>7. Writing about Polarization</p> <ul style="list-style-type: none"> <input type="checkbox"/> Each write a description of your polarization phenomena <input type="checkbox"/> Find some pictures to help and put them in the overleaf 	https://www.overleaf.com/learn/latex/Inserting_images
Writing/Presentation	<p>8. Start Poster</p> <ul style="list-style-type: none"> <input type="checkbox"/> Meet with me to start poster 	