Physics 495 Course Information

Overview: This class is a combined lecture and laboratory course in optics and optical instrumentation. Students will be introduced to basic concepts in optical physics and complete a variety of optics-related experiments that each demonstrate fundamental ideas in optical science.

Instructor: Dr. Charles I. Sukenik
Office: 2100D PSB
Phone: 757-683-3471
Email: csukenik@odu.edu
Office Hours: see Blackboard and by appointment

Web Site: Course information will be available on Blackboard at www.blackboard.odu.edu

Required: --“Physics of Light and Optics,” J. Peatross and M. Ware, 2015 ed. (free eText online at optics.byu.edu). A hardcopy may be purchased from Lulu.com.
--A Bound Laboratory Notebook

Useful Resources: --“Guide to LaTeX” by Helmut Kopka (a copy will be in the lab)

Meeting Times: MWF 2:00pm to 2:50pm. Additional laboratory time outside of class is expected.

Locations: Lectures will be in OCNPS 303 and Labs in OCNPS 224.
Your student ID will give you prox card access to the lab.

Exams: One Midterm Exam and a comprehensive Final Exam.
Midterm: October 18, 2019 (in class);
Final Exam: December 11, 2019 (12:30pm – 3:30pm).

Course Grade:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm</td>
<td>15%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Homework</td>
<td>20%</td>
</tr>
<tr>
<td>Written Lab Reports</td>
<td>30%</td>
</tr>
<tr>
<td>Laboratory Performance</td>
<td>10%</td>
</tr>
</tbody>
</table>

Homework: Homework will consist of reading assignments, problems from the text, performing calculations and answering questions related to laboratory exercises.

Attendance: Attendance in lab is mandatory. A portion of the Laboratory Performance grade will be based on attendance. The work done in the laboratory must be the basis for the written lab reports. More than two unexcused lab absences can result in a failing course grade.
Experiments: Each student will perform approximately 6-8 experiments over the course of the semester, working in teams of two, with 1-2 weeks allotted for each experiment.

All students will complete a laboratory module on these topics:
1. The Law of Reflection and Refraction / Exploring Thin Lenses
2. Single and Double Slit Diffraction; Diffraction of a Circular Aperture
3. Interferometry (Michelson or Mach-Zehnder or Fabry-Perot or Fizeau)
4. Linear and Circular Polarization of Light (Brewster’s Angle, Malus’s Law)
5. Spectroscopy (Grating Monochromator or Prism Spectrometer)
6. Spatial Filters and Fourier Optics

As part of these modules, you will also learn about Light Detection, Gaussian Beams, Fiber Optics, Faraday Rotation, Coherence of Laser Light and more.

Lab Notebook: You are required to have a bound laboratory notebook for all lab activities. Your lab notebook should be a neat (readable) record of everything you do in class. Each page must be dated. Your instructor will check to see that you have the notebook with you in class and that you are using it to record your notes and observations. It is not acceptable to take notes on loose pages and then copy them into your lab notebook. You should never rip pages out of your laboratory notebook!

Lab Reports: You will be required to submit three (3) formal lab reports for the course. You will be given detailed guidance on the expected format for laboratory reports. Your lab reports are expected to be of high quality and neatly formatted, including correct grammar, syntax, and spelling. All tables and figures should be labeled clearly and include captions. The write-up should contain the title of the experiment, your name, your partner’s name, an abstract, an introduction including theory and/or experimental motivation, description of the experiment you performed, analysis of data (including an error analysis) and results, conclusion, acknowledgements (if appropriate), and references. You are expected to prepare your report using LaTeX, which is widely available for free on the web. Lab report due dates will be posted on Blackboard. There will be a penalty for late reports!

University Honor Code: You are expected to conform to the University Honor Code in all aspects of your conduct in this course. Your written lab reports, including data analysis must be entirely your own work. Any cases of suspected academic dishonesty will be processed according to the policy in the Undergraduate Catalog.

Accommodation: Students are encouraged to self-disclose disabilities that have been verified by the Office of Educational Accessibility by providing Accommodation Letters to their instructors early in the semester in order to start receiving accommodations. Accommodations will not be made until the Accommodation Letters are provided to instructors each semester.