Physics 385: *Optics*

Fall 2020 **Course Schedule** Online Syllabus: **www.uwsp.edu/physastr/Documents/kmenning/Physics385.pdf**

Instructor:	Dr. Ken Menningen	**Office hours:**	M	T	W	R	F
Office:	B101 Science Building	8:00am - 10:00am	☺	☺			☺
Phone:	(715) 600-1286	1:00pm - 2:00pm				☺	☺
email:	Ken.Menningen@uwsp.edu	3:00pm - 4:00pm		☺		☺	
		By appointment	☺	☺	☺	☺	☺

Course Prerequisites: Physics 250, Math 226.

Required text: *Optics*, Hecht, 4th edition (available at Text Rental)

Other required materials: Scientific calculator (graphing capability is **not** necessary), table of integrals (such as *Pocket Book of Integrals* by CRC press)

Course Objectives: This course will contain a combination of classical and modern optics topics. A student who meets the learning outcomes of this course will be able to:

- Use mathematical representations of waves to describe the interaction of light with itself and with optical materials.
- Use the photon description of light to explain energy transfer.
- Predict image characteristics for any combination of lenses and mirrors in the paraxial approximation.
- Use mathematics to describe polarization, interference, and diffraction phenomena.
- Explain the fundamental principles behind laboratory spectroscopy and modern optical technologies.

The manipulation of light is a fascinating (and often complicated) topic, and I hope both your understanding and your curiosity about the subject will be enhanced as a result of this course.

Attendance: It is always to your disadvantage to miss any lectures ~~or labs~~. Assignments are due at the beginning of the class period on the day I indicate. Late assignments will be accepted with a 25% penalty per day. To avoid penalty for late assignments you must warn me by phone or email ***before they are due*** and make special arrangements. Late exams are not allowed, but in special cases you may take an exam early. The Canvas Learning Management System will be used for turning in assignments and exams.

Grading policy: The grade you earn in this class is based upon the three assignment types listed below. A grading scale is also given for your reference. Grades are not curved, encouraging you to work together, but I expect each student to hand in their own work. The lowest ~~lab and~~ homework grades will be dropped at the end of the semester.

Grading Scale

Letter	Score
A− → A	90 – 100
B− → B → B+	75 – 89
C− → C → C+	60 – 74
D → D+	50 – 59
F	0 – 49

Grade Breakdown

Assignment	Weight
Midterm exams	45%
Final exam	20%
Homework	35%
~~Labs~~	

Exams: Midterm exams are scheduled to occur on **October 9**, **November 6**, and **December 4**. These dates may change but it's not likely. The final exam, part of which will be comprehensive, is scheduled for Monday, **December 14** at 10:15 am.

Homework: A few example problems will be assigned regularly, often at each lecture. You should not believe that the homework problems are sufficient practice for the exam. Instead I recommend that you work out a few additional problems for each chapter from the text, and look at other optics texts in the library, or introductory physics textbooks. Practice helps a lot!

~~**Labs:** Eight lab activities are planned. Five of these involve collecting data with a lab partner and three will be completed as an entire class. The laboratory portion of your grade will be determined by your score on three formal lab reports. You may choose to write a report on any three of the five labs that you completed with a lab partner. The scoring rubric for the formal reports is shown below. The reports are due one week after completion of the lab activity.~~

Tentative Course Schedule

Week	Chs.	Topics
1	1, 2, 3	Electromagnetic waves
2	4, 5	Fresnel equations, spherical refraction
3	5	Thin lenses, curved mirrors
4	6	Optical systems
5	7	Wave superposition
6	7	Wave propagation
7	9,10	Interferometry, Fraunhofer diffraction
8	10	Diffraction
9	9	Thin films, Michelson interferometer
10	8	Polarization theory
11	8	Polarization effects
12	3	Lasers
13	other	Radiometry
14	13	Fourier optics
15	13	Nonlinear optics, atmospheric optics
[For a detailed course schedule with links to lecture content, see the online course schedule]		

Community Rights & Responsibilities:

Students with special needs should contact the Disability and Assistive Technology Center during the first two weeks of the semester in order to request accommodation. An Exam Accommodation Request Form is available online. Religious beliefs will be accommodated according to UWS 22.03 as long as the student notifies the instructor about the conflict within the first three weeks of class. Students are expected to maintain the highest standards of academic integrity for their work in this course. The University of Wisconsin-Stevens Point dedicated to a safe, supportive and non-discriminatory learning environment. It is the responsibility of all students to familiarize themselves with University policies regarding special accommodations, misconduct, religious beliefs accommodation, discrimination and absence for university sponsored events. (For details please refer to the Academic Concerns page, the Student Conduct Process page, and the Academic Integrity document.)