PHYS 101/121 Light and Visual Phenomena

The Combination *PHYS 101/121* has no prerequisites.
You can use this combination as a lab science or science perspectives. Pick One.

Instructor: Michael Ruiz, Ph.D.; Text: Online. **You need Internet access with Google Chrome.**
The textbook is free and at our website (a $250+ Savings). ruiz@unca.edu

RESERVE 24 HOURS PER WEEK FOR THIS COURSE.
This is our Contract. Please READ everything carefully before agreeing to take 101/121.

1. Class Attendance Due on Its Class Day: Watch Video, email me by the end of the day:
"On my honor, I have watched the entire 75-minute video for Class _____. The quiz answer is _____."
(Give Class Letter such as A, B, C and note that the Quiz Question is given at end of each video lecture.)
See Last Page for Making Up a Class.

2. Assignments: Homeworks HW A-Z, Labs 1-10, Projects 1-2.
Assignments listed during each week are due the coming Saturday by 6 pm.
Grace Period: You may work on your own without instructor assistance until Sunday, 11:59 pm.

3. Exams: Closed "Book/Notes/Everything" Except Calculator – HONOR CODE.

June 2020

Lab Week	Monday	Tuesday	Wednesday	Thursday	Friday
	1 ALWAYS	2 GET	3 AHEAD	4 OF	5 SCHEDULE
7 L1. Powers of Ten	8 A. Reflection HW A	9 B. Refraction HW B	10 C. E&M Waves HW C	11 D. Light and Matter HW D	12 E. The EM Spectrum HW E
14 L2. EM Spectrum	15 F. Light and Life HW F	16 G. Color HW G	17 H. Color Mixing HW H	18 I. Shadows, Eclipses HW I	19
21 L3. Spectroscopy & Project P1	22 Exam 1 (A-G)	23 J. Plane Mirrors HW J	24 K. Spherical Mirrors HW K	25 L. Lenses HW L	26
28 L4. Color Add L5. Color Sub	29 M. Aberrations HW M	30 N. Atmosphere HW N			

Last Day to Withdraw is June 29, 2020 (Always Double Check Date with Registrar).

Website: **www.opus.unca.edu/light/** or Google **unca light**

July 2020

Lab Week	Monday	Tuesday	Wednesday	Thursday	Friday
			1 O. Cameras HW O	**2** Special Grace Day for Late Work	**3** Eve of July 4th Holiday
5 L6. Color Wheels Exam Study	**6** Exam 2 (H-N) & Lab Exam LE1 (L1 - L5)	**7** P. Stops and Exposure HW P	**8** Q. Camera Lenses HW Q	**9** R1. Film	**10** R2. Film and Sensors HW R
12 L7. Camera Lenses, L8. Eye Lenses	**13** S1. The Eye	**14** S2. Eye Glasses HW S	**15** T. Perception HW T	**16** U. Color Perception HW U	**17**
19 L9. Perception L10. Illusions	**20** V. Cognitive Illusions HW V	**21** W. Optical Instruments HW W	**22** X. Lumens HW X	**23** Exam 3 (O-U)	**24**
26 Project P2	**27** Y. Einstein and Light HW Y	**28** Z. Quantum Optics HW Z	**29** All Work Due Grace Day for Late Work	**30** Study for the Final and LE2	**31** FINAL (A-Z) Lab Exam LE2 (6-10)

Class Resources and Goodies

1. Online Text: **www.opus.unca.edu/light/** Everything is there: text, tutorials, notes, assignments. Our website is like a cruise ship and was a top story on CNN: See http://www.mjtruiz.com/television.php

2. Class Attendance: You can miss 2 classes, but there is a bonus (10) for attending all classes. See Class Attendance on the first page for how you get attendance points and the last page for make-up.

3. Lab Attendance: You get lab attendance if you do 13 or 25 on time, but need 25 of 25 for full credit.

4. Notes: You get access to "Power Notes," guided sheets you can fill in class. See Downloads.

5. Homework: See the Calendar. Remember Saturday 6 pm and the Grace Period on page 1.

6. Projects: See the Calendar for when these occur.

7. Labs: See the Calendar. Note that the Lab is a separate course, PHYS 121.

8. Office Hours and The Forum: Help your peers out with assignments on our 24/7 online discussion forum. We will also schedule some Zoom Office hours each week based on your availablity.

9. Extra Credit for 101: Do questions in the text (the Blue) up until July 29.

10. Your Responsibilities: 1)Time: 24 hours per week since during a regular semester it is 12 hours per week (3 for class, 3 for lab, 6 for HW, P1, P2, and exam study); 2)Self-Learning: You can deal effectively with learning mostly on your own; 3)Schedule: You can keep to a schedule; 4)Perseverance: when confronted with critical-thinking questions, you do not give up, but meet the challenge; 5)Forum: You post any questions you have on the Forum and you enjoy communication by writing.

August 2020

| Monday	Tuesday	Wednesday	Thursday	Friday
3	4	5	6	7
10	11	12	13	14
17	18	19	20	21
24	25	26	27	28
31				

HAPPY PARSI NEW YEAR

Art in PHYS 101, I-ARC, and *CNN*

We have chosen a featured artist for the course: Élisabeth Louise Vigée Le Brun (1755-1842). Our website includes a special gallery of 60 of her portraits. Visit the Gallery to relax and enjoy the art.

The objective of *Light and Visual Phenomena* is a liberal-arts science course for non-majors. It includes the biology of the eye, medical prescription of eyeglasses, psychology of perception, optical illusions, photography, magic, color in art, and inventions. You will appreciate light and its many applications and expressions in the world.
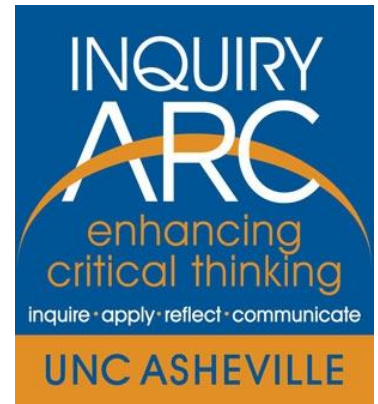
We follow the *UNCA* I-ARC model: Inquiry (understanding the question or problem at hand), Apply (using the appropriate principle, law, or formula), Reflect (reflecting on the answer to verify its validity), and Communicate (finally giving the answer with confidence with proper units and significant figures).

Our course was a top science/technology news story on *CNN*: *E-Book Learning*, which aired on *NEXT@CNN*, August 31, 2002. You can bookmark http://www.opus.unca.edu/light/

PHYS 101 Grading (This course typically has a class grade point average in the 2.6 to 2.8 range).
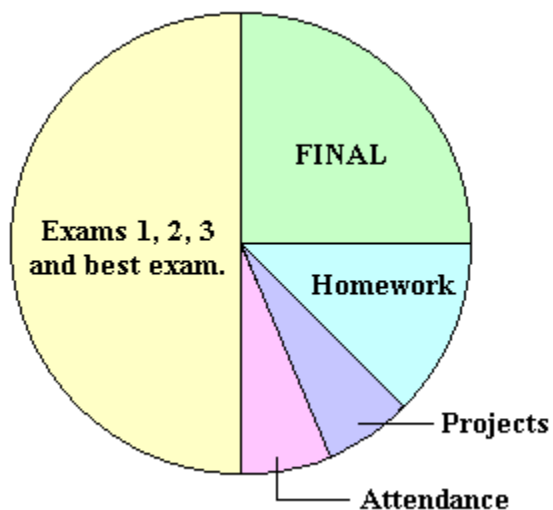
100	Exam 1 aka E1
100	Exam 2 aka E2
100	Exam 3 aka E3
200	Final aka FN
100	Best Exam Percentage
100	Web Homework (Due Weekly)
50	Two Web Projects (25 points each)
50	Minus 5 per miss after 2 free misses
800	**Total** (No + or - Grades, See Below)

A (740-800) - apply knowledge in new areas
B (660-739) - apply knowledge in familiar areas
C (580-659) - apply knowledge in easy areas
D (500-579) - misconceptions in principles
F (0-499) - serious gaps in understanding

Bonus and Borderline: If you attend all classes you get a 10-point bonus. If your grade is borderline, I will consider helping you if you come to class, put in effort with homework (HW), P1, P2, and extra credit. For very close cases I will also look for a strong Final. You may also retake E1, E2, and/or E3.

Class Make-Up: You may make up a class video late by watching the video and doing 4 extra credits for that class. You then get the attendance points plus the extra credit.

PHYS 121 Grading ((This course typically has a class grade point average in the 2.6 to 3.0 range).
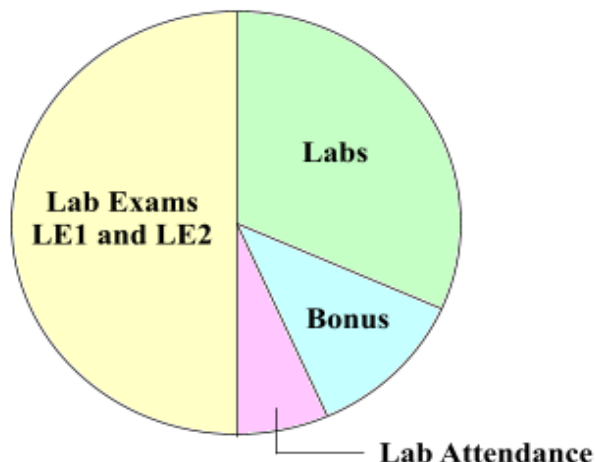
200	Lab Exam 1 aka LE1
200	Lab Exam 2 aka LE2
250	Labs (for getting all 25 "happies" per lab)
100	Bonus (+10 for getting at least 18 per lab)
50	Attendance (+5 for getting at least 13 per lab)
800	**Total** (No + or - Grades, See Below)

A (740-800) - apply knowledge in new areas
B (660-739) - apply knowledge in familiar areas
C (580-659) - apply knowledge in easy areas
D (500-579) - misconceptions in principles
F (0-499) - serious gaps in understanding

Borderline: If your grade is borderline, I will consider helping you if you have a near perfect lab, which means you received over 23 "happies" out of the max of 25 possible for each lab. I can help you out the most if you have all 25 "happies" out of the max of 25 possible for each lab. You can retake LE1.