

**PHY 3106 - U01: Modern Physics
Spring 2019**

Instructor: Dr. Rob Laird
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Office: CP 223
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Lectures: TR 11:00 a.m. – 12:15 p.m. in CP 101

Office hours: TR 1:30 – 3:30 p.m. and whenever my office door is open! You are **strongly encouraged** to stop by if you have any questions or need assistance.

Course Description: Development of modern physics. Topics include: special relativity, wave-particle duality, origins of quantum mechanics, and the Schrodinger wave equation.

Prerequisites: PHY 2049 and MAC 2312.

Textbook: *Modern Physics*, 3rd Ed., by Serway, Moses, and Moyer (ISBN: 978-0534493394)

Course Objectives: We will cover selected topics from Chapters 1 - 6 of the text. Specifically, we will study relativity, light, atoms, and quantum mechanics.

Learning Outcomes: Student successfully completing this course will demonstrate knowledge of the core principles of modern physics and be capable of effectively applying this knowledge and mathematics to solve modern physics problems.

Course Work:

- 1) **Homework Assignments** – This is a very important aspect of this course. You must acquire the skills to do physics and the best way to accomplish this is to work a lot of problems. Homework will be assigned regularly and will consist of questions, exercises, and problems from the textbook. If you have any trouble, please come see me at anytime. You are strongly encouraged to discuss homework problems with others. However, copying from other students is unacceptable.
- 2) **Exams** – There will be two exams. Exams will cover material from the lectures, readings, and homework assignments.
- 3) **Final Exam** – A final exam will be given at 9:45 a.m. on Thursday, April 25, 2019.

Homework Policy: Homework problems must be neatly done, with each problem begun on a fresh page. Multiple problems on the same sheet or sheets with multiple solutions to the same problem will not be accepted. No pages with scratched-out work will be accepted -- if you spoil the page, begin with a clean sheet. Problems will not be accepted if the solutions are scribbled sideways, upside down, or at the edge of another problem. There should not be multiple columns on a single page. Paper does not need to be ruled, but cannot be torn out of a notebook.
Homework assignments normally are due at the start of class on the due date

Grading: The course grade will be determined from homework assignments (20%), two exams (2 x 25% = 50%), and the final exam (30%).

Grading Scale:

A (93 – 100)	B+ (87 – 89)	C+ (77 – 79)	D (60 – 69)
A- (90 – 92)	B (83 – 86)	C (70 – 76)	F (< 60)
	B- (80 – 82)		

Attendance Policy: Students are expected to attend every class. Students will be allowed to make-up work only if they can present written evidence (from a doctor or recognized university authority) that their absence was unavoidable.

Student Conduct: All students are expected to follow the rules outlined in the Florida International University Student Handbook. As a courtesy to your classmates and the professor, please turn off your cell phone and your laptop.

Academic Honesty and Plagiarism: Students must not cheat or plagiarize, and they must not condone these behaviors nor assist others who cheat or plagiarize. Academic misconduct not only jeopardizes the career of individual student involved, but it also undermines the scholastic achievements of all students and attacks the mission of this institution. Students are responsible for doing their own work, thereby insuring the integrity of their academic records. A complete description of this policy is listed in the Florida International University Student Handbook.

Students with Disabilities: Florida International University seeks to provide equal access to its programs, services, and activities for people with disabilities. Any student who feels he/she may need an accommodation based on the impact of a disability should contact the University's Disability Resource Center to discuss your specific needs. The DRC is located in GC 190 and can be contacted by phone (305-348-3532) or by email (drcupgl.fiu.edu). Accommodations can then be made with reasonable prior notice to your professor.

Disclaimer: The instructor reserves the right to modify this syllabus and the policies outlined within it.

Tentative Schedule (subject to change)

Dates	Topics Covered
Jan 7 – 11	Chapter 1: Relativity I
Jan 14 – 18	Chapter 1: Relativity I
Jan 21 – 25	Chapter 1: Relativity I
Jan 28 – Feb 1	Chapter 2: Relativity II
Feb 4 – 8	Chapter 2: Relativity II
Feb 11 – 15	Chapter 3: Quantum Theory of Light
Feb 18 – 22	Exam 1: Chapter 1 - 2 Chapter 3: Quantum Theory of Light
Feb 25 – Mar 1	Chapter 3: Quantum Theory of Light
Mar 4 – 8	Chapter 4: Particle Nature of Matter
Mar 11 – 15	Spring Break
Mar 18 – 22	Chapter 4: Particle Nature of Matter Monday, Mar 18 - Last Day to Drop with DR
Mar 25 – 29	Chapter 5: Matter Waves
Apr 1 – 5	Exam 2: Chapters 3 - 4 Chapter 5: Matter Waves
Apr 8 – 12	Chapter 6: Quantum Mechanics in One Dimension
Apr 15 – 19	Chapter 6: Quantum Mechanics in One Dimension
Apr 22 – 26	Final Exam (9:45 – 11:45 a.m. on Thursday, April 25, 2019)