

## PHYSICS 383 - Intermediate Quantum Physics - Spring 2018

- David Hedin - LaTourette 224 - hedin@niu.edu
- Class: M-W-F 10:00 - LaTourette 227
- Office Hours: M-W 11:00 - 11:50
- [nicadd.niu.edu/~hedin/383/383.html](http://nicadd.niu.edu/~hedin/383/383.html)
- textbook: **Modern Physics** 2nd Edition by Randy Harris
- additional textbooks: **Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles** by Robert Eisberg and Robert Resnick. This is an older book at a junior level but with more and different examples than Harris.

Chapter	Sections skipped	Problems	Date due
2: Special Relativity	1,2,4,8,9	handout	1/26
3: Waves and Particles I	6	17,26,29,31,40,47	2/2
4: Waves and Particles II	1,5	20,38,48	2/7
5: Simple Bound States	4,9,10	24,27,35,57,58	2/21
6: Simple Unbound States	4	21,35	2/28
7: Quantum Mechanics in 3D and H atom	9,10	24 a-d,25,45,56	3/7
8: Spin and Atomic physics	-	30,41,55,67,72,79	3/28
9: Statistical Mechanics	2,8,9	52,61,62,64	4/4
10: Molecules and Solids	4,7,8,10	27,37,56,57	4/18
11: Nuclear Physics	4	27,39,43,51,71	4/25
12: Particle Physics	2,4,7	30,34,35,36,38,39,42,46,47	5/3

probable test dates

- Test 1: Ch. 2-4 Friday Feb. 9
- Test 2: Ch. 5-7 Friday March 9
- Test 3: Ch. 8-9 Friday April 6
- Test 3: Ch. 10-12 Monday May 7 (during finals week)

All tests are 50 minutes long, open book and worth 100 points. No cell phones out and calculators will be provided. The problems are worth 100 points total. They are due the dates listed; anything late will be marked down. A solution set is available in the main office the day before they are due. No minus grades will be given and plus grades will be decided on at the end of the class. The grading scale will be no higher than:

- A = 400 points
- B = 340 points
- C = 290 points
- D = 220 points

The learning goals of this course are the understanding of the underlying physics concepts including special relativity, quantum mechanics, and statistical physics which produce the observed properties of atoms, molecules, solids, nuclei, and subatomic particles. The learning outcome of this course is the student being able to explain the observed properties of atoms, molecules, solids, nuclei, and subatomic particles using the underlying physics concepts.

Northern Illinois University is committed to providing an accessible educational environment in collaboration with the Disability Resource Center (DRC) [drc@niu.edu](mailto:drc@niu.edu). Any student requiring an academic accommodation due to a disability should let their faculty member, and are encouraged to contact the DRC. Cell Phones/Computers in Classroom: Cell phones are not to be used in class. This includes reading or sending text messages or utilizing the Internet. If you use a cell phone in class you will be asked to leave. If a computer is being used in the classroom it must be used only to take notes. Class Visitation Policy: Due to liability concerns, only NIU students are allowed to attend classes at NIU. Guests, including family members and NIU students not registered for the course, will not be permitted to attend class except with prior arrangement with the instructor. Academic Misconduct: For a detailed description of the university's definition of academic misconduct, and the process by which it is adjudicated, please refer to the Student Code of Conduct. Sanctions (consequences) for committing academic misconduct include but are not limited to, failure of the assignment, failure of the course, and suspension or expulsion from Northern Illinois University. Cheating and plagiarism will not be tolerated.

Academic integrity and civility in the classroom are expected of every member of the NIU community. Syllabus Clause and Contract: This syllabus may be revised and adapted throughout the semester to better serve the needs of the class. The instructor may assign additional reading and/or assignments as needed. Additionally, the decision to remain in this class upon receipt of the syllabus serves as students' acceptance of the syllabus as a binding contract, meaning they agree with the terms set forth and the expectations of them as members of the class. Religious Observances: Northern Illinois University, as a public institution of higher education in the State of Illinois, does not observe religious holidays. It is the university's policy, however, to reasonably accommodate the religious observances of individual students. Absence from classes or examinations for religious observance does not relieve students from responsibility for any part of the course work required during the period of absence, and they should provide reasonable notice of when they will be absent.