

# Physics 5810: Quantum Mechanics and Quantum Statistical Mechanics

## Course Outline

**Description:** (From the course catalog) “The postulates of Quantum Mechanics, Matrix Mechanics, angular momentum coupling, scattering, perturbation theory, intrinsic spin, emission and absorption of radiation. Fermi-Dirac and Bose-Einstein statistics with applications in quantum theory.”

**Prerequisites:** (From the course catalog) PHYS 3702 (Classical Mechanics 1), PHYS 3704 (Thermodynamics and Classical Statistical Mechanics Laboratory) and MATH 3705 (Differential Equations).

**Textbook:** *Principles of Quantum Mechanics*, by Ramamurti Shankar, Springer Verlag.

Supplemental references available upon request. Last time this course was taught a student found the Schaum’s Outline “*Quantum Mechanics*” useful, so I intend to pick some ideas/problems from that text as well.

**Attendance:** Although attendance will not be recorded, there will be no makeups for exams, quizzes, and in class work that counts towards your grade, and so it is imperative that you are in class and ready to participate fully.

The class will meet in room 2010 of Ward Beecher Hall at 1-2pm, Monday, Wednesday and Friday.

### Assignments:

**Homework** (about 7 problems a week) will be assigned. As each homework due date passes a full answer key for each of the assigned problems will be posted on the website (see below). Many of these questions will be the basis of quiz and exam problems, and so it is imperative that you work the problems assigned *and ones like them in your book(s)!*

The homework will be collected and graded. I strongly encourage you all to work together on the homework; you will learn much from each other.

**Midterms:** There will be three midterms; Each of these midterms will be a full class period long. They are all closed book, though you will be allowed one 8’-by-11’ inch cheat sheet (both sides) that you will sign and hand in with you exam. The midterm dates are

Friday, Oct. 15 (on chapters 1 through 2);

Friday, Oct. 13 (emphasizing chapters 3 through 7) , and

Friday, Nov. 17 (emphasizing chapters 9 through 13 ).

There will be no make up exams. If you miss one for a valid excuse (which must be agreed upon with the professor *before* the exam) the average of your other two exams will count as the missed exam.

**Final Exam:** The comprehensive final exam will cover chapters 1 through 17 (with chapters 8 and 16 excepted). It will be a two hour exam on,

Friday Dec 15, From 10:30-12:30

**Grading policy:** Each midterm is worth 100 points. The homework will also be averaged into a 400 point score. The final exam will count for 300, leading to a total of 1000 points.

The resulting grading scale will be

850+ A

750-850 B  
600-750 C  
500-600 D  
500- F

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**Course Web Site:** <http://mjrcrescimanno.people.ysu.edu/5810/>

**Mandatory Statement of Non-Discrimination from the University:** Youngstown State University does not discriminate on the basis of race, color, national origin, sex, sexual orientation, gender identity and/or expression, disability, age, religion or veteran/military status in its programs or activities. Please visit [www.ysu.edu/ada-accessibility](http://www.ysu.edu/ada-accessibility) for contact information for persons designated to handle questions about this policy.

**Students with Disabilities:** In accordance with University procedures, if you have a documented disability and require accommodations to obtain equal access in this course; please contact me privately to discuss your specific needs. You must be registered with the Center for Student Progress Disability Services, located at 36 West Wood Street, and provide a letter of accommodation to coordinate reasonable accommodations. You can reach CSP Disability Services at 330-941-1372.

**Class Cancellation:** If this class is being cancelled for any one day due to instructor illness, or other reasons, an e-mail will be sent to the student's YSU e-mail account as soon as possible, and a cancelled class notice will be put on the classroom door. University-wide class cancellation is a decision made by the President's Office, and officially announced via the YSU homepage and on WYSU (88.5 FM) radio. Students may also register at the YSU Portal to receive a text message about University-Wide closures via the Emergency Alert Notification System.

**Incomplete Grade Policy:** An incomplete grade of I may be given to a student who has been doing satisfactory work in a course, but, for reasons beyond the control of the student and deemed justifiable by the instructor, has not completed all requirements for a course when grades were submitted. A letter grade MAY NOT be changed to an I (Incomplete) after the term has ended and grades have been recorded. For Fall Term courses, the final date to complete an I will be March 1 of the following term; for Spring Term courses, September 1; for Summer Term courses, October 1. These dates can only be extended with the approval of the instructor and the Dean of the College where the course is taught. Forms for extension of the deadline may be obtained in the Physics & Astronomy office and after obtaining the proper signatures, this form must be to the University Records office 24 hours before the original deadline (i.e. for Fall Term courses, March 1 of the following term).

**Center for Student Progress (CSP):** The Marion G. Resch Center for Student Progress is a resource on Campus established to help students successfully complete their University experience. Please phone 330-941-3538 or visit the Center for assistance in tutoring or for individualized assistance with social and academic success. The main Center is located in Kilcawley West below the bookstore.