

PHYS 5810 - Quantum Mechanics and Quantum Statistical Mechanics 1

Fall 2026 Syllabus, Section 01, CRN 43547,

Credit hours: 3

Course Meeting Times

MWF 10am-10:50am in Ward Beecher Hall 2026 (8/24 to 12/12)

Instructor

Michael Crescimanno

Email: mjcrescimanno@ysu.edu

Public Instructor Information

Instructor Title: Professor of Physics

Instructor Professional Qualifications: Physics Ph. D. (U. C. Berkeley, 1991), MSc Physics ((U. C. Berkeley, 1988), BS Physics (Princeton, 1985)

Instructor Office Location: Ward Beecher 2015

Instructor Office Phone: 330 941 7109

Private Instructor Information

Student Support Hours/Office Hours: M3-5, T10-11,
W 11-12, F 4-5

Additional Contact Methods: microsoft360

Preferred Contact Method: dcphntn@gmail.com

Communication Expectations: Will respond to gmail within 24 hours, 48 hours for microsoft360

How to Refer to me: Most students call me Dr. C.

Notes:

Course Description

5810. Quantum Mechanics and Quantum Statistical Mechanics 1. The postulates of wave 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. Must be taken in sequence before PHYS 5811. Prereq.: PHYS 3703 and PHYS 3704 and MATH 3705 or MATH 3705H. 3 s.h.

Course Readings

Group	Title	Author	ISBN
Required	Principles of Quantum Mechanics	R. Shankar	146157675X

Principles of Quantum Mechanics,
by Ramamurti Shankar, Springer Verlag

The course readings are subject to change in the event of extenuating circumstances, research developments, current events, and/or to ensure better learning.

Additional Course Materials

Copyrighted material made, maintained and distributed by the instructor will be made available either as paper or online at:

<https://mjcrescimanno.people.ysu.edu/>

Course Learning Outcomes/Objectives/Goals

1) have analytic facility of states rotating in hilbert space, linear operators, symmetry operators and hermitean observables and the measurement process that makes up the core concepts of 'reality' as we have come to understand it in quantum mechanics.

2) Be versant in solving and interpreting solutions of Schrodinger's equation in select low (0-3) space dimensional systems. This includes problems with spherical symmetry (angular momentum), and scattering problems.

How to Succeed in This Course

Technology

In addition to blackboard access, you will need an internet enabled phone and/or laptop to access online class resources.

Math-wise, the class uses algebra and calculus, but much of the emphasized math will be taught and practiced with the class.

To successfully complete this course, you will need access to a computer with internet and Microsoft Office Suite (available free). Blackboard is free to use with your YSU login here. Please let me know the first day of class if you do not have the appropriate access to technology and/or anticipate having trouble navigating Blackboard. We will work together to make sure technology is not a barrier to your success in this course.

Blackboard: Please be sure to login to Blackboard at least weekly during the duration of the course. Blackboard will be regularly used to share important course information.

Understanding Early Alerts

In all your classes, your professors can create a "flag" related to your performance in a class. Professors may indicate that you are having difficulty understanding course material, not attending class, missing assignments, etc. These alerts do NOT stay on a permanent record, and they are NOT used in any way as a penalty against you. The alerts are used to help you find a solution that is realistic and helps you succeed.

How to Get Help

YSU is committed to your success. As a student you have access to several resources that may be instrumental in helping you succeed in this course and others. Please do not hesitate to utilize any of these free support services to support your academic success, physical and mental health, and help you navigate your time as a YSU student.

[Click here for YSU Student Support Resources](#)

Attendance Expectations

Class attendance adheres to the YSU Class Attendance Policy and the Religious Accommodations of Students Policy.

I will not be taking attendance. However, we will have in-class exercises during many of the class periods.

Late Work Submission Policy

Late work submission adheres to the YSU Class Attendance Policy and the Religious Accommodations of Students Policy.

I will not be accepting late work. You can miss one quiz without any impact on your final grade. Midterms cannot be missed except for medical urgencies. If you know that your schedule (sports, work, etc) makes it impossible for you to be available during the midterm days, let me know a week or two out so we can make an accomodation. All midterms are 50 minutes long and take place in the regular class period. See below for the schedule.

Additional Course Expectations

A positive learning environment involves commitment of both instructor and students in a course. Reciprocal Responsibilities for Undergraduate Students and Instructors was developed jointly with the Student Government Association and YSU Academic Senate to outline mutual responsibilities in the classroom, and our class will follow these guidelines.

Artificial Intelligence Policy Statement

AI Use Prohibited

Students are not allowed to use generative artificial intelligence such as ChatGPT on assignments in this course. Each student is expected to complete each assignment without substantive assistance from others, including automated tools. Any use of AI tools for work in this class may be considered a violation of the *YSU Code of Conduct*.

Why? For 2 reasons. The use of AI seriously short-circuits your brain's ability to develop the technical and personal skills (patience, fortitude, time-on-task) that we seek to build up in this class. Secondly, much of the material you will be given is copyrighted by the authors and they have not agreed to being studied by AI engines.

Assignments/Assessments

Other (100%)
points

1000

Grading and Grading Scale

YSU courses follow the YSU Grading System.

In addition to the brief in-class exercises, there is weekly homework on the course website. There will also be about 4 chapter quizzes in class (1/2 period) after some of the meatier chapters, all pre-announced. No cheat sheets for the quizzes (see below).

There will be three midterms; Each of these midterms will be a full class period (50 minutes) long.

They are all closed book, though you will be allowed

one 8'-by-11' inch "cheat sheet" (hand-written, both sides, NO PHOTOCOPYING!) that you will sign and hand in with your exam. The midterm dates are

Friday, Sept. 18

Friday, Oct. 23

Friday, Nov. 20

The comprehensive final exam will take place on

Friday, Dec. 11, 8-10AM

Each midterm is worth 100 points. The in-class chapter quizzes will be averaged to a 100 point score (thus each quiz will each be worth about 25 points and aggregate attendance score worth 25 points). The in-class exercises (a participation grade) for a 50 point score. The homework will also be averaged into a 300 point score. The final exam will count for 250 points, 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

University Policies

University policies can be found online and provide you guidance on your rights as a student in this course. The links below take you directly to a specific policy. Should you have any questions about a policy, please do not hesitate to contact me using the information at the top of the syllabus.

- [Statement of Non-Discrimination from the University](#)
- [Academic Integrity/Honesty](#)
- [Student Accessibility](#)
- [Digital Accessibility](#)
- [Incomplete Grade Policy](#)
- [YSU Class Attendance Policy](#)
- [Religious Accommodation of Students](#)

Schedule of Topics and Assignments

Day	Date	Reading(s)	Proposed Topic	Due/To Prepare for Class
Mon	8/24		Math review	
Wed	8/26		Math review	

Fri	8/28	failures of classical mech. , waves review
Mon	8/31	postulates of quantum mech

The course schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better learning.