

# PHYS 350 MODERN PHYSICS

## BASIC INFORMATION

**Course prefix, catalog number, and title:** PHYS 350, Modern Physics

**Number of credits:** 3 credit hours

**Term and year:** Spring 2026

**Classes:** Tu and Th 11:00 - 12:15 PM, South Engineering, RM 118

**Instructor:** Dr. Yongki Choi

**Office location:** South Engineering 220A

**Office hours:** Tu and Th 12:15 - 1:00 pm and by appointment

**Phone Number:** 701-231-8968

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**Physics Teaching Assistants Office Hours:** [http://www.ndsu.edu/physics/current\\_students/ta\\_office\\_hours/](http://www.ndsu.edu/physics/current_students/ta_office_hours/)

**Student Success Program Tutoring Hours:** [http://www.ndsu.edu/studentsuccess/tutoring\\_schedule/](http://www.ndsu.edu/studentsuccess/tutoring_schedule/)

## BULLETIN DESCRIPTION

Breakdown of classical physics, special relativity, Bohr model, Schrodinger mechanics of simple systems, atomic structure, selected topics from nuclear and solid state physics.

Pre-requisite: PHYS 252, Co-requisite: MATH 259 or MATH 265

## COURSE OBJECTIVES

The main objective of the course is to develop the concept and quantitative methods that are critical for a working knowledge of 21<sup>st</sup> modern physics. After completing this course, students will enhance their ability to think critically and solve real-world problems. Additionally, the student should be able to explain concepts in relativities, quantum mechanics, and statistical physics and demonstrate the ability to analyze and solve conceptual and practical problems.

## REQUIRED STUDENT RESOURCES

Recommended textbook: *Modern Physics* by Paul Tipler and Ralph Llewellyn

Recommended textbook: *Modern Physics for scientists and Engineers* by John Morrison

## SYLLABI ON WEB PAGES

Syllabus, Announcements, and Notes will be posted on our Blackboard course homepage: <https://bb.ndsu.nodak.edu>

## HOMEWORK ASSIGNMENTS

Homework will be posted on our Blackboard course homepage. All homework assignments are due on the dates specified.

***Late submissions will not receive credit.***

## COURSE SCHEDULE/OUTLINE/CALENDAR OF EVENTS

Week	Topic	Reading /Assignment
1	Introduciton of modern physics	Review
2	Postulates of special relativity	Chapter 1
3	Time dilation and length contraction	Chapter 1
4	Relativistic space and time	Chapter 2
5	Relativistic momentum and energy	Chapter 2
6	<b>Exam 1, Feb 17, 11-12:15pm</b>	
7	Introduction of qunatum mechanics	Chapter 3
7	Photoelectric effects	Chapter 3
8	Atomic spectra, bohr model	Chapter 4
9	<b>Spring break</b>	Chapter 4
10	<b>Takehome Exam/Reading assignment</b>	Chapter 5
11	Uncertainty principle, Wave-Particle duality	Chapter 5

12	Matter waves	
12	<b>Exam 2, Apr 2, 11-12:15pm</b>	Chapter 6
13	Schrodinger equation	Chapter 6
14	The infinite square well	Chapter 6
15	Schrodinger equation in three dimensions	Chapter 7
16	Hydrogen atom wave functions	Chapter 7
17	Dead Week, Reviews	
18	<b>Exam 3, May 13, 1 pm</b>	

### **PHYS 350: EVALUATION PROCEDURES AND GRADING CRITERIA**

Final letter grades for the course will be computed using the following weights:

- Homework Assignments 25 %
- Exam 1 25 %
- Takehome Exam 10%
- Exam 2 15 %
- Exam 3 25 %
- Total Points 100 %

#### **NO MAKE-UP EXAMS ARE ALLOWED**

Grades A:  $\geq 90\%$ , B: 80 to  $< 90\%$ , C: 70 to  $< 80\%$ , D: 60 to  $< 70\%$ , F:  $< 60\%$

### **ATTENDANCE**

According to [NDSU Policy 333 \(www.ndsu.edu/fileadmin/policy/333.pdf\)](http://www.ndsu.edu/fileadmin/policy/333.pdf), attendance in classes is expected. Veterans and student service members with special circumstances or who are activated are encouraged to notify the instructor as soon as possible and are encouraged to provide Activation Orders.

### **AMERICANS WITH DISABILITIES ACT FOR STUDENTS WITH SPECIAL NEEDS**

Any students with disabilities or other special needs, who need special accommodations in this course, are invited to share these concerns or requests with the instructor and contact the [Disability Services Office \(www.ndsu.edu/disabilityservices\)](http://www.ndsu.edu/disabilityservices) as soon as possible.

### **ACADEMIC HONESTY**

The academic community is operated on the basis of honesty, integrity, and fair play. [NDSU Policy 335: Code of Academic Responsibility and Conduct](http://www.ndsu.edu/fileadmin/policy/335.pdf) applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the [Office of Registration and Records](http://www.ndsu.edu/registrationandrecords). Informational resources about academic honesty for students and instructional staff members can be found at [www.ndsu.edu/academichonesty](http://www.ndsu.edu/academichonesty).

*\*The instructor reserves the right to adjust or modify this syllabus if it is deemed beneficial to student learning*