**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 2024  
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  
Email Address: yongki.choi@ndsu.edu  
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 21st 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 relativity, 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](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**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Reading /Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Electric charge, field, potential, energy</td>
<td>Review</td>
</tr>
<tr>
<td>2</td>
<td>Electromagnetic Wave</td>
<td>Review</td>
</tr>
<tr>
<td>3</td>
<td>Relativity, Time Dilation, Length Contraction</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>4</td>
<td>Relativistic momentum and energy</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>5</td>
<td>General relativity</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>6</td>
<td>Quantization of Charge, Blackbody Radiation</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>7</td>
<td>Photoelectric Effect, Compton Effect</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>7</td>
<td>Exam 1, Feb 20, 11-12:15 PM</td>
<td>Chapters 1-3</td>
</tr>
<tr>
<td>8</td>
<td>Atomic Spectra, Bohr model</td>
<td>Chapter 4</td>
</tr>
<tr>
<td>9</td>
<td>X-ray spectra, Franck-Hertz Experiment</td>
<td>Chapter 4</td>
</tr>
<tr>
<td>10</td>
<td>De Broglie Hypothesis, Wave Packets</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>11</td>
<td>Spring break</td>
<td></td>
</tr>
</tbody>
</table>

Source: NDSU Academic Affairs Committee

Updated: 01/09/2017
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 %
- Exam 2 25 %
- Final Exam 25 %
- Total Points 100 %

NO MAKE-UP EXAMS ARE ALLOWED
Grades  A: ≥ 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), 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) 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 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. Informational resources about academic honesty for students and instructional staff members can be found at www.ndsu.edu/academichonesty.

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