



NEW JERSEY CENTER  
FOR TEACHING & LEARNING

## **PHYS 6607: Physics Capstone & Praxis Preparation**

**Instructor:** Yuriy Zavorotniy

**Email:** yuriy@njctl.org

**Course Credit:** 5.0 NJCTL credits

### **Dates & Times:**

This is a 5-credit, self-paced course, covering 6 modules of content. The exact number of hours that you can expect to spend on each module will vary based upon the module coursework, as well as your study style and preferences. You should plan to spend 6-12 hours per module, completing the module slides, readings, Short Answer Assignments, labs, Mastery Exercises, practice problems, and module exams.

### **COURSE DESCRIPTION:**

This course is for teachers to review and extend their prior study of physics and also serves as a review for the Praxis Physics Content Knowledge Test (5265).

Teachers will learn core foundational concepts in modern physics topics as well as the pedagogical content knowledge needed to successfully teach introductory physics to students.

### **STUDENT LEARNING OUTCOMES:**

Upon completion of the course, the student will be able to:

1. Apply the basic laws of physics in the areas of quantum physics, nuclear physics, thermodynamics, fluids, geometric optics and special topics in modern physics.
2. Apply student-centered pedagogy to teach physics to students.
3. Apply basic mathematical tools commonly used in physics including algebra, trigonometry, and graphical analysis.
4. Prepare for comprehensive exam for physics certification.
5. Identify, understand, and communication the elements, representations, and models of scientific phenomena to solve scientific problems.
6. Examine, investigate, and assess the relationships between various physics models and their variables.

### **TEXTS, READINGS, INSTRUCTIONAL RESOURCES:**

**Required Texts:**

<https://njctl.org/courses/science/algebra-based-physics/>

<https://njctl.org/courses/science/ap-physics-1/>

<https://njctl.org/courses/science/ap-physics-2/>

These materials include:

- SMART Notebook presentations with direct instruction and formative assessment questions linked to polling devices
- Classwork and homework documents with extra practice problems and answers
- Labs - guided or inquiry versions with embedded videos to show teachers how to set up the lab
- Multiple Choice Review Guides

**COURSE REQUIREMENTS:**

Consistent attendance in your online courses is essential for your success. Failure to verify your attendance within the first 7 days of this course may result in your withdrawal. If for some reason you would like to drop a course, please contact the Dean of Students.

Online classes have assignments and participation requirements just like on-campus classes. Budget your time carefully. If you are having technical problems, problems with your assignments, or other problems that are impeding your progress, let your instructor know as soon as possible.

**GRADE DISTRIBUTION AND SCALE:**

In order to receive a Passing grade, the participant must complete the following course requirements: all short answer assignments, mastery exercises, labs, exams, and the reflection paper outlined in the *Assignments* section of the Class Schedule (below).

**Grade Distribution:**

Module Exams	70%
Final Exam	15%
Mastery Exercises	11%
Reflection Paper	4%

**Grade Scale:**

A	93 – 100
A-	90 – 92
B+	86 – 89
B	83 – 86
B-	80 – 82
C+	77 – 79

C	73 – 76
C-	70 – 72
D	60.0 – 69.9
F	59.9 or below

**ACADEMIC STANDING:**

NJCTL has established standards for academic good standing within a student’s academic program. Students enrolled in any NJCTL online course must receive an 80 or higher to successfully complete a course and receive credit for that course. An 80 is equivalent to a GPA of 2.7 or B-. Additionally, students in an endorsement program must receive a cumulative GPA of 3.0 for all courses combined in order to successfully complete the program.

**ACADEMIC INTEGRITY:**

Students must assume responsibility for maintaining honesty in all work submitted for credit and in any other work designated by the instructor of the course. Academic dishonesty includes cheating, fabrication, facilitating academic dishonesty, plagiarism, reusing /re-purposing your own work, unauthorized possession of academic materials, and unauthorized collaboration.

**CITING SOURCES WITH APA STYLE:**

All students are expected to follow proper writing and APA requirements when citing in APA (based on the APA Style Manual, 6th edition) for all assignments.

**DISABILITY SERVICES STATEMENT:**

We are committed to providing reasonable accommodations for all persons with disabilities. Any student with a documented disability requesting academic accommodations should contact the Dean of Students, Dr. Jamie Korn, additional information to coordinate reasonable accommodations for students with documented disabilities (Jamie@njctl.org).

**NETIQUETTE:**

Respect the diversity of opinions among the instructor and classmates and engage with them in a courteous, respectful, and professional manner. All posts and classroom communication must be conducted in accordance with the student code of conduct. Think before you push the Send button. Did you say just what you meant? How will the person on the other end read the words?

Maintain an environment free of harassment, stalking, threats, abuse, insults or humiliation toward the instructor and classmates. This includes, but is not limited to, demeaning written or oral comments of an ethnic, religious, age, disability, sexist (or sexual orientation), or racist nature; and the unwanted sexual advances or intimidations by email, or on discussion boards and other postings within or connected to the online classroom.

If you have concerns about something that has been said, please let your instructor know.

**CLASS SCHEDULE:**

Module	Required Readings	Assignments
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<b>1 – Special Theory of Relativity</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• Mastery Exercises</li> <li>• Test</li> </ul>
<b>2 – Alternating Current Circuits</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• Mastery Exercises</li> <li>• Test</li> </ul>
<b>3 – Mechanics</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• Mastery Exercises (8)</li> <li>• Test</li> </ul>
<b>4 – Electricity &amp; Magnetism</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• Mastery Exercises (4)</li> <li>• Test</li> </ul>
<b>5 – Optics &amp; Waves</b>	<ul style="list-style-type: none"> <li>• Chapter 30 in <i>Principles with Applications</i>; 30.7-30.13</li> <li>• Chapter 31 in <i>Principles with Applications</i></li> </ul>	<ul style="list-style-type: none"> <li>• Mastery Exercises (2)</li> <li>• Test</li> </ul>
<b>6 – Thermal Physics</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• Mastery Exercises</li> <li>• Test</li> </ul>
<b>7 – Modern Physics</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• Mastery Exercises (2)</li> <li>• Test</li> </ul>
<b>8 – Scientific Inquiry, Processes, &amp; Social Perspectives</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• Mastery Exercises</li> <li>• Test</li> </ul>

**9 – Final Reflection**

- None

- Reflection Paper
- Final Exam