



NEW JERSEY CENTER
FOR TEACHING & LEARNING

Progressive Science Initiative® (PSI®)

CHEM6783: Learning and Teaching PSI Chemistry Capstone & Praxis Prep Course

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Course Credit: 3.0 NJCTL credits

Dates & Times:

This is a 3-credit, self-paced course, covering 8 modules of content, and one laboratory safety module. 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 approximately 15 hours per credit working online, and up to 30 hours per credit working offline.

Graduate Student Handbook: www.njctl.org/graduate-handbook/

COURSE DESCRIPTION:

This capstone course is for teachers to learn further topics from the student course *PSI Advanced Placement Chemistry* and how to teach those topics to students, while providing teachers a greater depth of understanding to support their teaching of *PSI Chemistry*. Topics covered in this course include equilibrium, biochemistry and organic chemistry. This capstone course also serves as a review for the Praxis Chemistry Content Test.

STUDENT LEARNING OUTCOMES:

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

1. Review comprehensive topics in chemistry including: matter, energy, nuclear & atomic structure, periodicity, nomenclature, chemical composition, bonding and structure, chemical reactions, thermodynamics, solutions, acids and bases, organic and biological chemistry.
2. Apply safe laboratory practices including appropriate use, maintenance, and calibration of lab equipment, as well as safe usage, storage and disposal of lab materials.
3. Demonstrate safe laboratory procedures and practices.
4. Apply basic mathematical principles commonly used in chemistry, including algebra, dimensional analysis, and graphical analysis.
5. Identify, understand, and communicate the elements, representations, and models of scientific

- phenomena to solve scientific problems.
6. Examine, investigate, and assess the relationships between various chemistry models and their variables.

TEXTS, READINGS, INSTRUCTIONAL RESOURCES:

Required Texts:

- PSI Chemistry uses a free digital text book accessible at: <https://njctl.org/courses/science/ap-chemistry/>
- Participants will download SMART Notebook presentations, homework files, labs, and teacher resources from the PSI Chemistry Courses
- Lindley, David. (2016). *Boltzmann's Atom: The Great Debate that Launched a Revolution in Physics*. The Free Press. ISBN-13: 978-1501142444

Recommended Texts and Resources:

ETS Chemistry Content (5245) Preparation Materials: <https://www.ets.org/praxis/prepare/materials/5245>

Cobb, C, Fetterolf, M. (2010). *The Joy of Chemistry: The Amazing Science of Things*. Amerherst, NY: Prometheus Books. ISBN-13: 978-1591027713

Holton, G. J., Brush, S. G., & Holton, G. J. (2001). *Physics, the Human Adventure: From Copernicus to Einstein and Beyond*. New Brunswick, N.J: Rutgers University Press. ISBN-13: 9780813529080

PhET (simulations) - <https://phet.colorado.edu/en/simulations/category/chemistry>

COURSE REQUIREMENTS:

In order to receive a Passing grade, the participant must complete the following course requirements:

1. Activities: A number of different learning activities will ensure participant engagement and learning in the course. These include:
 - Engage in video module lessons which demonstrate minimized direct instruction followed by frequent formative assessment
 - Completion of formative assessments aligned to learning objectives which include detailed analysis when answered incorrectly.
 - Interaction with module discussion boards that allow conversation with peers and course instructors about the module's content, delivering that content to students. Discussion boards also serve as a place to ask and answer questions related to the module's content.
2. Mastery Exercises: For each module, these multiple-choice question quizzes assess the content knowledge gained in a module. Participants have the opportunity to retake; random questions are pulled from a larger question bank on each attempt ensuring varied questions.
3. Module Exam: One is completed at the end of each module. It is a culminating exam consisting of praxis-like multiple-choice questions aligned to the exam objectives.
4. Reflection Paper: At the end of the course, participants are required to reflect on the knowledge taught in the course, make connections, and compare/contrast their current pedagogy with new strategies gained in this assignment.

5. Final Exam: At the end of the course, a comprehensive exam consisting of multiple choice questions assesses the content knowledge learned throughout the course in preparation for the praxis exam. In this module, there is also an ungraded practice final exam.

GRADE DISTRIBUTION AND SCALE:

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, Melissa Axelsson, for additional information to coordinate reasonable accommodations for students with documented disabilities (melissa@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
1 – Matter, Energy, & Thermodynamics	<ul style="list-style-type: none">• Module lessons.	<ul style="list-style-type: none">• Mastery Exercise• Module Exam
2 – Atomic & Nuclear Structure	<ul style="list-style-type: none">• Module lessons.	<ul style="list-style-type: none">• Mastery Exercise• Module Exam
3 – Nomenclature, Bonding, & Structure	<ul style="list-style-type: none">• Module lessons.	<ul style="list-style-type: none">• Mastery Exercise• Module Exam
4 – Chemical Reactions	<ul style="list-style-type: none">• Module lessons.	<ul style="list-style-type: none">• Mastery Exercise• Module Exam
5 – Solutions & Solubility	<ul style="list-style-type: none">• Module lessons.	<ul style="list-style-type: none">• Mastery Exercise• Module Exam

6 – Acid-Base Chemistry	<ul style="list-style-type: none"> • Module lessons. 	<ul style="list-style-type: none"> • Mastery Exercise • Module Exam
7 – History, Processes, & Procedures in Chemistry	<ul style="list-style-type: none"> • Module lessons. 	<ul style="list-style-type: none"> • Mastery Exercise • Module Exam
8 - Reflection	<ul style="list-style-type: none"> • Review module lessons as desired. 	<ul style="list-style-type: none"> • Reflection Paper • Module Exam