



NEW JERSEY CENTER  
FOR TEACHING & LEARNING

## **CHEM-6705: Learning and Teaching PSI Advanced Chemistry II**

Course Credit:

6.0 CTL credits

Dates & Times:

This is a 6-credit, self-paced course, covering 7 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 12-20 hours per module, completing the module slides, readings, short answer assignments, labs, mastery exercises, practice problems, and module exams.

Graduate Student Handbook: [njctl.org/graduate-handbook/](http://njctl.org/graduate-handbook/)

### **COURSE DESCRIPTION:**

This advanced chemistry course is for teachers to learn the content of PSI AP Chemistry and how to teach that course to students. The student course is designed to be taught to students who have taken PSI Chemistry prior to this course. This is a mathematically rigorous chemistry course that builds upon foundational topics in physics and leads to a better understanding of biology. Topics include thermodynamics, kinetics, equilibrium, acids & bases, aqueous equilibria and electrochemistry.

### **PREREQUISITES/CONCURRENT COURSEWORK:**

The prerequisites for this course are CHEM-6701: Teaching and Learning PSI Chemistry and CHEM-6703: Learning and Teaching PSI Advanced Chemistry I. This course is designed to be taken concurrently with CHEM-6702: Field Experience in Teaching PSI Chemistry I.

### **STUDENT LEARNING OUTCOMES:**

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

1. Demonstrate mastery of Advanced Chemistry I on a comprehensive exam.
2. Demonstrate mastery of pedagogical content knowledge for teaching Advanced Chemistry I.
3. Identify, understand, and communicate the elements, representations, and models of scientific phenomena to solve scientific problems.

4. Demonstrate that chemical elements are fundamental building material of matter that can be understood in terms or arrangement of atoms.
5. Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.
6. Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.

#### 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
- Strathern, P. (2001). *Mendelyev's Dream: The Quest for the Elements* (1sted.). Thomas Dunne Books. ISBN-13: 978-0312262044

##### Recommended Texts and Resources:

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:

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 your advisor.

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 Assignment Section of the Class Schedule Below.

## GRADE DISTRIBUTION AND SCALE:

### Grade Distribution:

Module Exams	70%
Final Exam	10%
Short Answer Assignments	6%
Labs	6%
Mastery Exercises	6%
Reflection Paper	2%

### 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 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 [Jamie@njctl.org](mailto:Jamie@njctl.org) for additional information to coordinate reasonable accommodations for students with documented disabilities.

## 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	<b>Mendelyev's Dream – Prologue, Ch.1, 2</b>	<ul style="list-style-type: none"> <li>• Short Answer Assignment (20 points)</li> <li>• Lab (20 points)</li> <li>• Mastery Exercise (15points)</li> <li>• Module Exam (60 points)</li> </ul>
2	<b>Mendelyev's Dream – Ch. 3 and 4</b>	<ul style="list-style-type: none"> <li>• Short Answer Assignment (20 points)</li> <li>• Lab (20 points)</li> <li>• Mastery Exercise (15points)</li> <li>• Module Exam (60 points)</li> </ul>
3	<b>Mendelyev's Dream – Ch. 5 and 6</b>	<ul style="list-style-type: none"> <li>• Short Answer Assignment (20 points)</li> <li>• Lab (20 points)</li> <li>• Mastery Exercise (15points)</li> <li>• Module Exam (60 points)</li> </ul>
4	<b>Mendelyev's Dream – Ch. 7 and 8</b>	<ul style="list-style-type: none"> <li>• Short Answer Assignment (20 points)</li> <li>• Lab (20 points)</li> <li>• Mastery Exercise (15points)</li> <li>• Module Exam (60 points)</li> </ul>
5	<b><i>Mendelyev's Dream – Ch. 9 and 10</i></b>	<ul style="list-style-type: none"> <li>• Short Answer Assignment (20 points)</li> <li>• Lab (20 points)</li> <li>• Mastery Exercise (15points)</li> <li>• Module Exam (60 points)</li> </ul>
6	<b>Mendelyev's Dream – Ch. 11 and 12</b>	<ul style="list-style-type: none"> <li>• Short Answer Assignment (20 points)</li> <li>• Lab (20 points)</li> <li>• Mastery Exercise (15points)</li> <li>• Module Exam (60 points)</li> </ul>
7	<b>Mendelyev's Dream – Ch. 13 and 14</b>	<ul style="list-style-type: none"> <li>• Short Answer Assignment (20 points)</li> <li>• Lab (20 points)</li> <li>• Mastery Exercise (15points)</li> <li>• Module Exam (60 points)</li> </ul>

8	Review course topics	<ul style="list-style-type: none"><li>• Reflection Paper (45 points)</li><li>• Final Exam (150 points)</li></ul>
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