

**ROBERT S. WELCH CENTER FOR GRADUATE AND PROFESSIONAL STUDIES
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SYLLABUS

**Preparing Students for Advanced Placement® Chemistry: Extended
AP 591.200** (Instructor: John Hnatow)

This course is designed for AP Chemistry teachers who have previously completed any 4-5 day 2013 - 2016 APSI. Extending learning from a prior AP Chemistry session, the focus of this course will involve Curriculum Framework activities, the new curricular requirements, and introduction of guided inquiry labs and inquiry experiences in the classroom. Additional course experiences will include reflecting/debriefing about classroom and lab activities implemented in the classroom, discussing successful strategies for teaching the new content areas, incorporating successful inquiry labs, converting traditional labs to inquiry labs, and generating "new style" questions. This session also will include analysis of test data. Time and guidance will be provided for collaboration and practice with the above topics. Opportunities will be provided for participants to share strategies for incorporating more inquiry in both the lab and the classroom. Each teacher will bring materials to share for major content or challenge areas (i.e., equilibrium, buffers, electrochemistry, IMFs), such as notes, labs, exams, formative assessments, and suggestions for refining and adopting different approaches. There will be one to two hours of homework daily.

Dates and times that the course meets: Monday through Thursday, 8:30 a.m. to 4:00 p.m.
Friday, 8:30 a.m. to 1:00 p.m.

Note **required texts or supplemental readings:** Brown, LeMay, Bursten et al, Chemistry, AP Edition, or a comparable College Board approved textbook from the bibliography below will be included in supplied course materials. Participants should peruse the information available on the AP Chemistry Homepage on AP Central as described in the pre-Institute work.

Course objectives

- To provide the most current information regarding the structure and grading of the AP Chemistry exam.
- To provide and compare examples of multiple choice and free response questions from the "old" exam and the "new" exam.
- To provide an overview of the new AP Chemistry curriculum concepts, skills and knowledge and give teachers both theoretical background and hands-on experience to help them re-design their current courses.
- To discuss topics newly added to the course. These will include but not be limited to photoelectron spectroscopy.
- To discuss, share, and practice teaching strategies and techniques for student success in challenging content areas. A focus will be on a learner-centered classroom.
- To become familiar with the AP Chemistry curriculum framework, the big ideas and enduring understandings, and the science practices.

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- To perform several of the requisite and some advanced laboratory investigations in order to satisfy the requirements of and enhance the AP curriculum.
- To describe and classify various levels of inquiry labs and the creation of models to guide students in meaningful inquiry.
- To become familiar with the College Board's science practices from the science curriculum frameworks
- To experience inquiry based labs from a student perspective.
- To learn how to modify and transition from traditional "cookbook" labs into inquiry based labs.
- To demonstrate how inquiry-based activities, calculator applications, science demonstrations, Internet resources, and digital technologies can be used in an AP Chemistry course.
- To examine and use the AP science curriculum framework and AP exams as benchmarks for the new AP Audit requirements.
- To inspire teachers to motivate their students to achieve at the highest possible levels.

Please note that the AP Teacher Standards: Content Knowledge, Teacher Certification, Pedagogy, Analysis and Reflection, and Ongoing Professional Development, are addressed in the outcomes listed below:

Graduate Programs in Education Outcomes

1. GPE001: Knowledge - Theory: Apply knowledge of psychological and educational theory, research, and/or philosophy related to science specialization or certification.
2. GPE002: Knowledge - Assessments: Demonstrate understanding and use of the types of assessments appropriate to the area of science certification.
3. GPE003: Knowledge - Purpose: Identify the purpose of education in society, and be able to analyze why things happen in the educational community and/or in the political community that surrounds education.
4. GPE004: Knowledge - Diversity: Demonstrate knowledge of concepts related to diversity, and the interaction between concepts related to diversity and the area of science specialization or certification.
5. GPE005: Skills - Theory: Demonstrate the ability to incorporate theory and research into practice related to the area of science specialization or certification..
6. GPE006: Skills - Data: Demonstrate the ability to gather appropriate data and use data in problem analysis and decision-making related to the area of science specialization or certification..
7. GPE007: Skills - Problem Solving: Use problem solving/critical thinking strategies appropriate to the area of science specialization or certification..
8. GPE008: Skills - Reflection: Use reflective practice within the area of science specialization or certification..

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9. GPE009: Skills - Communication: Demonstrate effective communication and presentation skills related to the area of science specialization or certification..
10. GPE010: Skills - Technology: Use a variety of technologies appropriate for working in the area of science specialization or certification..
11. GPE011: Dispositions - Service: Demonstrate service to the community.
12. GPE012: Dispositions - Diversity: Demonstrate positive dispositions toward diversity and equity.
13. GPE013: Dispositions - Professionalism: Demonstrate professionalism in one's demeanor, behavior, conduct, decision-making, and interactions with colleagues.

Attendance policy: *If you are taking the course for credit, no absences are permitted. You must attend all five days all day to receive graduate credit.*

Instructor contact: email at apchem307@gmail.com

Detail Breakdown of Course*

**Preparing Students for Advanced Placement® Chemistry: Extended
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**Day 1
AM**

- Welcome and Introductions
- Overview of the Institute, Texts, College Board Resource materials
- Equity and Access
- Reflection and debriefing of classroom experiences after teaching the new course for one year
- Successful strategies for teaching the new content areas: photoelectron spectroscopy

PM

- Sharing of materials from major content or problem areas (i.e. equilibrium, buffers, electrochemistry, IMFs), such as notes, labs, exams, formative assessments, suggestions for refining and adopting different approaches.
- Assignments: AP Style questions and Presentation and Discussion of the most recent AP Exam
- Laboratory investigation
- Lab debriefings
- Best Practices: Presentation/Discussion of a teaching activity.

**Day 2
AM**

- Continue sharing of materials from major content or problem areas (i.e. equilibrium, buffers, electrochemistry, IMFs), such as notes, labs, exams, formative assessments, suggestions for refining and adopting different approaches.

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PM

- Laboratory investigation
- Lab debriefings
- Best Practices: Presentation/Discussion of a teaching activity.

Day 3

AM

- Reflection and debriefing of lab experiences after teaching the new course for one year
- Successful strategies for teaching the new content areas
- Homework Assignments
- Continuation of sharing of materials from major content or problem areas

PM

- Assignments: Presentation and Discussion of the most recent AP Exam
- Laboratory investigation
- Lab debriefings
- Use of statistics in lab data analysis
- Best Practices: Presentation/Discussion of a teaching activity.

Day 4

AM

- Incorporating successful inquiry labs
- Converting traditional to inquiry labs
- Converting multiple choice questions for released exams into questions that would be found in the new format
- Generating more questions for homework and assessment.
- Incorporating student data into teaching methods, strategies, and assessments
- Analyzing test data

PM

- Score distributions
- Instructional Design and Assessment
- Continuation of sharing of materials from major content or problem areas
- Assignments: Presentation and Discussion of the most recent AP Exam
- Laboratory investigation
- Lab debriefings
- Best Practices: Presentation/Discussion of a teaching activity.

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**Day 5
AM**

- Inquiry in the classroom
- POGIL Activities
- Present Useful Chemistry Websites
- Scoring the AP exam
- AP Report to teachers
- What to do after the Exam
- Lab debriefings and cleanup
- Final Participant Sharing Session

* The topics listed and the order of the outline is subject to change slightly as it is highly dependent on the College Board's PD materials availability by the start of the APSI.

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BIBLIOGRAPHY

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AP591.200 (Instructor: John Hnatow)

AP Chemistry Guided-Inquiry Experiments: Applying the Science Practices Teacher Manual (The College Board 2013)

AP Chemistry Guided-Inquiry Experiments: Applying the Science Practices Student Manual (The College Board 2013)

Jespersen, Neil, and Alison Hyslop. *Chemistry: The Molecular Nature of Matter, 7th Edition*, © New York: John Wiley & Sons.

Brown, Lemay et al., *Chemistry: The Central Science 13th Edition*, ©2015. Upper Saddle River, NJ: Pearson Education, Inc.

Burdge, Julia. *Chemistry 3rd edition*, ©2015. New York: McGraw-Hill.

Chang, Raymond, and Kenneth Goldsby. *Chemistry, AP* Edition, 11th Edition Update*, ©2014. New York: McGraw-Hill.

Hnatow, John, and Ketan Trivedi. *High School Chemistry for AP Achievement 4.0, Chemistry In a Flash*, ©2014. Blacksburg, Virginia: Paperless Publishing Corp.

Kotz, John C., Paul M. Treichel, John Townsend, and David Treichel., *Chemistry & Chemical Reactivity. 9th Edition*, ©2015. Independence, KY: Cengage Learning.

Masterton, William L., Cecile N. Hurley, and Edward Neth. *Chemistry: Principles and Reactions. 7th Edition*, ©2012. Independence, KY: Cengage Learning.

McMurry, John and Robert C. Fay. *Chemistry. 6th Edition*, ©2012. Upper Saddle River, NJ: Pearson Education, Inc.

Moore, John W., and Conrad L. Stanitski. *Chemistry: The Molecular Science 5th edition*, ©2015. Independence, KY: Cengage Learning.

Oxtoby, David, H. Pat Gillis, and Alan Champion. *Principles of Modern Chemistry. 7th Edition*, ©2012. Independence, KY: Cengage Learning.

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Spencer, James N., George M. Bodner, and Lyman H. Rickard. *Chemistry: Structure and Dynamics*, ©2011. New York: John Wiley & Sons.

Tro, Nivaldo, K. *Chemistry: A Molecular Approach. 3rd Edition*, ©2013. Upper Saddle River, NJ: Pearson Education, Inc.

Whitten, Kenneth, W., Raymond Davis, Larry Peck, and George G. Stanley. *Chemistry 10th edition*. ©2014. Independence, KY: Cengage Learning.

Zumdahl, Steven, and Susan Zumdahl. *Chemistry. 9th Edition*, ©2014. Independence, KY: Cengage Learning.

Description of Requirements for Graduate Credit

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Each participant will be expected to do Pre-work before attending the class, to work daily on AP Exam questions, a supplied chemistry college textbook, and an electronic Chemistry Homework website. These questions will be presented and discussed in class. Each participant will be required to 1) Present a “best practices” lesson plan 2) Annotate and present a useful chemistry web site. 3) Complete required lab activities. 4) Develop an AP-level guided inquiry experiment for presentation to the class. 5) Submit a chemistry Challenge area document as per instructor specifications. Somewhat subjectively, the quality of each participant’s participation will be evaluated.

Due date for final project(s): received by instructor by July 7, 2017, which will be sent in electronic format to J. Hnatow at apchem307@gmail.com

Accessing Grades and Transcripts:

Goucher College does not issue grade reports. You can obtain your grade approximately 3 weeks after concluding the course by going to the Goucher website ([mygoucher](http://mygoucher.com)) and follow the prompts to receive your grade.

If you need a paper copy of grades for tuition reimbursement, you will need to request a transcript in writing. You can fax to Student Administrative Services, or call SAS (410)-337-6504 or mail to SAS at:

Goucher College, SAS
1021 Dulaney Valley Road
Baltimore, MD 21204

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There is no charge for this request. Please allow 3-5 working days to process.
To access the transcript request form, please go to <http://www.goucher.edu/x1891.xml>

Questions? Please call 410-337-6200.

Pre-institute assignments

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- Peruse and become familiar with the links on the AP Chemistry Homepage at http://apcentral.collegeboard.com/apc/public/courses/teachers_corner/2119.html
Look for the following documents: the newest version of the AP Chemistry Curriculum Framework, the Webcast on PES, AP Chemistry: An Overview of Course Revisions, FAQs, Course Planning and Pacing Guides, Higher Ed Validation, Inquiry Instruction, Open Forum, Audit Information, America's Lab Report, the teacher's edition of the New AP Chemistry Lab Manual, and generally anything that is notated as being *NEW*.
- Each teacher will bring materials to share for a major content or problem area (i.e., equilibrium, buffers, electrochemistry, IMFs), such as notes, labs, exams, formative assessments, and suggestions for refining and adopting different approaches. This will be incorporated into a "challenge area" document that will constitute the graduate project. It would be best if these are in electronic format (Word, Excel, PowerPoint, pdf, etc).
- Prepare at least one "best practices" sample lesson to share. This can be a lab, an assignment, an activity, an approach to a topic, etc. Be prepared to give a five-minute presentation of this "best practices" lesson that work well for you. Please note that it must be at the AP level. If possible, please bring the lesson on a jump drive to share with other participants.
- Email 1 or 2 maximum chemistry related web sites to John (apchem307@gmail.com) that you have found to be useful in your classroom. Include a short annotation or description of the value of using the sites in an AP chemistry class. One or both of these sites will be shared and presented to the class.
- Request via email and fill out and return a participant survey (apchem307@gmail.com) at your earliest convenience.

Participants are asked to bring the following

- A laptop computer
- A jump drive with files of your favorite classroom activity or experiment to share with other participants
- A Texas Instruments TI83 or TI84 Graphing Calculator
- Safety Glasses or goggles

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- Please bring sneakers or closed toe shoes to wear in the laboratory (Labs start on Monday.)
- Please bring your school's calendar for the 2016-17 academic year.
- Although you will receive at least one textbook when you arrive, you might want to bring a College-Level Chemistry book (only if convenient). Be prepared to solve and present AP test questions, perform experiments that correlate with and help teach content, and use the Vernier LabQuest™, and we will discuss many ways to be successful teaching AP chemistry!