



Chemistry 163 (CHEM&163-03) Syllabus, Spring, 2017

Welcome to Chemistry!

We would like to help you succeed in

- the preparation for your intended major
- your lifelong application of Chemistry in whatever your career becomes
- the outcomes of this course

We want to engage you to

Learn Actively,

You'll be asked to learn from sources, learn by doing, and learn by explaining content and processes to someone else.

Think Critically, Creatively and Reflectively,

You'll be asked to solve problems, to explain solutions to someone else, and to reflect on others' alternative approaches. You will enrich your attention to detail.

Communicate with Clarity and Originality,

You'll be asked to make verbal explanations, give clear answers in writing, teach content to the class, and communicate effectively in a laboratory setting both verbally and in your records.

and

Interact in Diverse and Complex Environments.

You'll be asked to interact among students of different cultures, diverse levels of preparation, diverse family and personal situations. You will be expected to be an effective and sought-after team member.

This course will immerse you in these learning outcomes.

We are a partnership of:

- your classmates
- the Cascadia community
- your instructor

David Reichgott (CC2-389)

dreichgott@cascadia.edu

425-352-8165

Please drop in any time my door is open.



Chemistry 163-03 (CHEM&163), Spring Quarter '17

Chem&163 Sec. 03 (item #1950): Class 3:30–5:35 PM, Tu, Th in CC1-010. Lab W 3:30 PM –6:00 PM in CC1-330

Unless pre-approved, you are required to attend the class and laboratory section that you are registered for.

- Description:** In this third in a three-quarter sequence for science and engineering majors, students use equilibrium, kinetics and thermodynamics with applications in acid-base chemistry and electrochemical cells. Concepts and applications in nuclear and biochemistry are introduced. Laboratory extends content, emphasizing experimental design, analysis, project activity, communication of results, and safety. (LAB)
- Prerequisites:** Chemistry 162 with a grade of 2.0 or better. If you did not complete 162 at Cascadia, you may be asked to provide evidence of your grade from an equivalent course.
- Instructor:** Dr. David Reichgott (CC2-389)
Office Phone/Voice Mail 425-352-8165 email: dreichgott@cascadia.edu or through Canvas
Hours: Tu, W, Th 2:30 – 3:20 pm (W may be in CC1-330)
Appointments and “drop-ins” are welcome; **stop in any time my door is open.**
Web page: <http://faculty.cascadia.edu/dreichgott/> (contains link to CHEM&163 web page)
This optional page will contain all course information and assignments.
- Text:** Paul Kelter, Michael Mosher, and Andrew Scott, “Chemistry – The Practical Science,” 1st ed. (2008); ISBN 9780547053936. The “Media Enhanced” edition is not required and you may purchase a used copy without a CD or key code. A set of text errata will be provided.
- Also Required:** A hardbound (not spiral) 7½ x 9¼ laboratory notebook or similar size (you may use your 162 lab notebook); Safety goggles. A calculator that is not a telephone. Access to Canvas. Competence in Graphical Analysis by the fourth lab session.
- Canvas (REQUIRED):** Course documents, including Unit Outcomes and daily Power Point slides, assignments, and all Laboratory experiments and supplemental materials are available on Canvas; content is located under “Files.” **When printing Power Point content** be sure to select “Print What ...Handouts...6 per page”.
- In case of college closure or instructor’s absence:** In the event of a campus closure, please log into CANVAS at <http://cascadia.instructure.com> for announcements and instructions. On each “out” day a set of instructions, including options for lab and document delivery, will be posted under Files, in a document titled “Instructions for (date)”. All assignments that must be turned in must be done in Microsoft Word (or Works word processor, or .txt) format or scanned to a png or pdf format, and delivered by email to dreichgott@cascadia.edu. Photographic or low-quality scans may not be accepted. All aspects of academic honesty must be followed (see below). For CANVAS instructions, including technical support information, please visit <http://www.cascadia.edu/programs/elearning/canvasinstructions.aspx>
- Reserve Items (optional):** Available at the Library, optional text: “Introductory Chemistry,” M. S. Cracolice & E. I. Peters; Available at the Library, CD: “Graphical Analysis”, Vernier Software (licensed for student installation).
- Content:** Chapters 15 through 22 of Kelter. Rate laws and factors affecting kinetics, equilibrium as a dynamic state, acid/base, ion and redox equilibria, buffer systems, coordination complexes, electrochemistry, nuclear chemistry, and structure and function of DNA, RNA, and proteins. Laboratory extends content, emphasizing experimental design, analysis, project activity, communication of results, and safety.
- Outcomes:** Daily outcomes are also listed in each “Unit Syllabus”. At the end of this course you should be able to:
- Learn Actively**
- Express reaction rate in terms of reactant and product concentrations, and describe conditions that effect rate
 - Describe the dynamic nature of equilibrium and effects of change in reaction variables
 - Use equilibrium expressions to describe acid/base, ion and redox reactions
 - Use experimentation to demonstrate and experience buffer behavior

- Balance redox equations and describe qualitatively and quantitatively how electrochemical cells work
- Learn how to apply chemical instruments to evaluate real-world phenomena
- Describe the interrelationships among DNA, RNA, and proteins
- Take responsibility for accessing and using a variety of sources to further examine areas of scientific interest

Think Critically, Creatively, and Reflectively

- Evaluate experimental data in order to determine a reaction's rate and order
- Apply evidence of reaction order to the description of its mechanism
- Develop strategies to approach, solve, and understand problems involving equilibrium, rate and thermodynamics on both conceptual and quantitative levels
- From experimental properties, design and evaluate a buffer system
- Refine understanding of the scientific method, emphasizing analysis of investigations for flaws, limitations and sources of error or bias
- Generate connections between chemical concepts and other disciplines
- Use multiple chemical concepts to solve complex problems
- Design, conduct and present results of a real-world chemical problem

Communicate with Clarity and Originality

- Express chemical concepts using formulas, chemical equations, graphs, vocabulary and mathematic notation
- Express and interpret uncertainties in quantitative information
- Use computer resources to analyze data, generate graphs and present lab reports
- Present experimental results in multiple ways, including narrative, graphs and diagrams

Interact in Diverse and Complex Environments

- Work with peers to perform laboratory experiments and solve problems
- Demonstrate the appropriate use of chemistry lab techniques and equipment
- Refine insights into the interactions between theory and experimentation
- In all group work, listen and contribute with respect and honesty
- Critically assess and challenge scientifically explanations of self, peers and experts

Assignments: A "Unit Syllabus" for each of four units will be distributed with daily outcomes, reading, suggested problems, "prepared problems", and **graded homework** assignments and due dates. Late assignments will be accepted, less 10 % if within 24 hours, less 20 % if later, but not accepted if the assignment is returned to the class.

"**Prepared problems**" are to be prepared in writing before each class except as noted in the Unit Syllabus. They are reviewed by peer groups, and scored for completeness at the start of class only. You are encouraged to compare solutions, and question each other on unclear areas. I will collect one group's problems at random each class to check scoring and revise if warranted. You must be present to receive credit; there are no makeups. Four required, in-class, graded Group Sheets and several ungraded worksheets.

Assignments are expected to be submitted in person. If this is impossible, any assignment transmitted electronically must be in .doc, .docx, .txt or .pdf, file format, and of a file size that does not inhibit transmission. Having a document rejected by an email system does not relieve you of the need to submit it on time. If scanned or photographed, the readability of the document is the responsibility of the sender.

Group presentation of laboratory content. Each student is required to attend all presentations of their section and participate in assessment and the final group sheet. A 25% (10 pt.) deduction will be made if participation is not complete.

Class-time focus and student responsibility: This course is heavy with content, and it is elected by students with diverse future pathways, some of which require all the content to be covered. Our class-time will be focused on those areas that are best learned through collaborative activities, or are those where instructor support is most needed. For us to be successful, there is a need for you to be responsible for your own learning of content not covered in class, and to use the study skills of an independent learner. The "Unit Syllabus" is one of the ways to support you in your efforts. Cascadia's expectations for classroom behavior conform to the Washington Administrative Code (WAC). These may be found in Student Handbook or at http://www.cascadia.edu/academic_resources/handbook.aspx . Cell phones and other communication devices are not to be used in the classroom or laboratory.

Study technique recommendations:

- Check the outcomes on the Unit Syllabus for the class ahead of time.
- Skim the text sections before class, paying close attention to bold-face vocabulary terms, boxed items, and figures. This should take no more than 20 minutes.
- Read the assigned text sections as soon as possible after class.

- Compare the outcomes to your class notes, taking care to review material not covered in class.
- Learn actively by explaining concepts and relationships to someone else.
- Learn collaboratively by solving recommended exercises in a study group.
- Complete the Prepared Problems for next class.

Exams: Three hour exams during classes, coupled to graded Group Sheets, and a short quiz for Unit 4. The examinations are cumulative to the extent that concepts and skills introduced in earlier units are applied in later units. There is no comprehensive final exam. Exams can be made up only for unusual circumstances and **only** if I am notified in advance.

Grading:

Prepared Problems	17 x 2 pts.	34 pts.
Exams	55, 45, 50, 10 pts.	160 pts.
Group Sheets	2 x 10, 2 x 8 pts.	36 pts.
Graded Homework	4 x 10 pts.	40 pts.
Presentation		40 pts.
Laboratory*	see below	190 pts.
Total:		500 pts.

*This is a laboratory science course that may be used to satisfy college requirements. To meet these requirements and to meet prerequisites of subsequent courses, you must obtain a passing grade average in the laboratory component of the course.

4.0 :	90%-100%	2.0 - 2.4	65% - 74%
3.5 - 3.9:	85%-89%	1.0 - 1.9 :	55%-64%
3.0 - 3.4:	80%-84%	0.0 :	Below 55%
2.5 - 2.9 :	75% -79%		

Other grades (I, N, P/NC, V, W, Z) may be assigned in compliance with the College academic policies, which can be found at: http://www.cascadia.edu/academic_resources/academic_policies.aspx

Policy on Incomplete (I) and Withdrawal (W) grades: An Incomplete, as described in the College Catalog, is arranged for ahead of time with the instructor through an Incomplete Contract, and only in the case where the majority of the instruction has been completed. I will interpret this as having missed no more than three class sessions and one laboratory (unless a makeup is possible). A grade will be assigned when the contract is completed. A Withdrawal may be made without instructor approval through May 8th; after that date an application and approval must be made through Student Services – Kodiak Corner.

Transfer Issues

CHEM&163 transfers to the University of Washington as CHEM 162. Special circumstances apply when transferring to semester schools, and Advising needs to be consulted at the transfer school. For transfer to the University of Washington CHEM&162 and CHEM&163 must be taken at the same college; UW Engineering School accepts 162 (without 163) to satisfy the Major-Ready Pathways that require 161 and 162.

Cascadia Community College Syllabus Learning Agreement

Pluralism and Diversity: Cascadia believes in Pluralism, an intentional culture where everyone's history contributes to the collective success of our community.

Cascadia is committed to creating a supportive environment for a diverse student, faculty, and staff population. Individual differences are celebrated in a pluralistic community of learners.

Cascadia does not discriminate on the basis of race, color, religion, gender and/or sex, sexual orientation, national origin, citizenship status, age, marital or veteran status, or the presence of any sensory, mental or physical disability, or genetic information, and is prohibited from discrimination in such a manner by college policy and state and federal law. The following office has been designated to handle inquiries regarding non-discrimination policies and can direct inquiries to the appropriate office for ADA-related requests: Director of Human Resources, Office CC2-280, 425-352-8880.

Title IX: Title IX of the Education Amendments of 1972 prohibits discrimination on the basis of sex in education programs or activities that receive Federal financial assistance. In compliance with Title IX, Cascadia is committed to providing an educational environment free from sexual harassment, including acts of sexual violence or sexual assault. The College is equally committed to ensuring that those who raise complaints or participate in the investigation and resolution of complaints are free from retaliation. To raise a complaint or voice a concern with Cascadia's compliance with Title IX, Dr. Patricia Hutcherson, Interim Executive Director of Human Resources, at phutcherson@cascadia.edu or 425-352-8262.

Academic Honesty: The College regards acts of academic dishonesty, including such activities as plagiarism, cheating and/or violations of integrity in information technology, as very serious offenses. In the event that cheating, plagiarism or other forms of academic dishonesty are discovered, each incident will be handled as deemed appropriate. Care will be taken that students' rights are not violated and that disciplinary procedures are instituted only in cases where documentation or other evidence of the offense(s) exists. A description of all such incidents shall be forwarded to the Student Conduct Officer, where a file of such occurrences will be maintained. The Student Conduct Officer may institute action against a student according to the college's disciplinary policies and procedures as described in the *Student Handbook*: http://www.cascadia.edu/academic_resources/handbook.aspx

In this class, any work found to involve academic dishonesty will be given a grade of 0. Guidelines specific to this course:

The following are situations where I expect you to get help, share ideas, and work cooperatively:

1. Group sheets and worksheets.
2. Prepared Problems and graded homework when you are stuck (but please see below).
3. Preparing for lab (except what you actually write on your pre-laboratory assignment).
4. All aspects of in-laboratory activities.
5. Working-up laboratory data for your report and brainstorming ideas about report questions.

The following are examples of situations where I expect that your work will be **entirely** your own:

1. All aspects of examinations.
2. All written aspects of graded homework assignments.
3. All written aspects of pre-laboratory assignments.
4. All written aspects of laboratory reports.

The key distinction is when you write something down, it represents your own communication of your understanding. It is inappropriate to copy anyone's work or provide your answers to others, except where you are sharing data.

Student Rights and Responsibilities: Cascadia is a student-centered college, operated to provide knowledge and skills for the achievement of learners' academic, professional and personal goals. Inherent in the college's mission are certain rights and freedoms needed for learning and personal development. Admission to Cascadia provides these rights to students, and also assumes that students accept the responsibility to conduct themselves in ways that do not interfere with the purposes of the college in providing education for all of its learners. For the complete policy, see the Student Code of Conduct in the Student Handbook at http://www.cascadia.edu/academic_resources/handbook.aspx

Learning Assistance Options: To support student success, Cascadia offers a variety of support services. The Open Learning Center, CC2-060, provides a computer lab where students can receive assistance with technology to support class assignments. Students are encouraged to utilize the Math and Writing Center, located in CC2-080. Tutors will work with students focusing on math concepts and writing assignments; several also tutor Chemistry. Hours and contact information for the Math and Writing Center can be found at: <http://www.cascadia.edu/services/tutoring/>.

Online Tutoring and Writing Assistance: Cascadia provides online access to live tutors in a variety of subjects, provided by the Western e-Tutoring Consortium. Tutoring is offered through live, interactive sessions and through an Essay Center. Many subjects have convenient tutoring hours late into the evening and seven days a week, depending on tutor availability; schedules are available online. To get started, visit <https://www.etutoring.org/>

Disability Support Services: Cascadia provides services to help students with disabilities successfully adapt to college life. Students who meet specific criteria may qualify for reasonable academic accommodations. If you have or suspect you have a disability and need an accommodation please contact the front office in Kodiak Corner at 425-352-8860 to make an appointment, or email us at disabilities@cascadia.edu. Services and Accommodations through DSS are not retroactive. It is the student's responsibility to approach the faculty member with the accommodation letter as soon as it is issued from DSS.

Counseling services: If you have a personal problem or stress that is affecting you and would like to talk with someone, please contact [UWB's Mental Health Counseling Center](#). Counseling at Cascadia (provided through UWB) is confidential, professional and free (six sessions). Visit the Counseling Center front desk Monday through Friday, 8:30 a.m. to 5 p.m. or call 425-352-3183 for an appointment. The number for a 24-hour Crisis Line is 206-461-3222.

Advising: Students should schedule an appointment to meet with an advisor to consult about classes and degrees, and to create a tentative education plan. They can call 425-352-8860 or come to the Kodiak Corner to make an appointment. Appointments are not made via email. At the time of the appointment, they need to indicate which degree they are pursuing. See the Cascadia website <http://www.cascadia.edu/advising/academic.aspx> for information about Drop-In Advising hours.

Online Advising: Email advising is available at advising@cascadia.edu. Our distance advisor can answer most questions via email, but we don't schedule advising appointments via email.

Campus Closures and Inclement Weather: Information about signing up for alerts and notifications can be found at <http://www.cascadia.edu/services/emergency/alert.aspx>. The site includes instructions for subscribing to alerts. In the event of a campus closure, instruction for this class will continue on Canvas, as noted above.

In the event of inclement weather affecting morning classes, there will be notification on the local media by 5:30 a.m. Closure notices will be posted on Canvas and on the Cascadia web site. You may also call the main campus number: 425-352-8000 to hear a message that will be updated with the latest Cascadia closure information. Should the weather deteriorate during the day, you may check online, listen to the main campus message, check email or the media to hear news about closures or class schedule changes.

Emergency Procedures: Emergency procedures are posted in each classroom. To reach campus security personnel, dial 425-352-5222. City of Bothell fire and police may be reached by dialing either 9-9-1-1 or 9-1-1 from any campus phone. Campus emergency phones are located on campus walkways and parking lots.

Acceptable Use Policy on Information Technology: In general, the same ethical conduct that applies to the use of all college resources and facilities applies to the use of Cascadia's systems and technology. These systems may only be used for authorized purposes, using only legal versions of copyrighted software, and with consideration and respect for the conservations of resources and the rights of other users. For additional information, see the online version of the Student Handbook at http://www.cascadia.edu/academic_resources/handbook.aspx or go to the Open Learning Center for assistance with any questions.

Family Education Rights and Privacy Act (FERPA): Cascadia Community College complies with the Family Education Rights and Privacy Act (FERPA) of 1974 concerning the information that becomes a part of a student's permanent educational record and governing the condition of its disclosure. Under FERPA, students are protected against improper disclosure of their records. See http://www.cascadia.edu/academic_resources/handbook.aspx

Laboratory: There are seven laboratory experiments during your scheduled laboratory periods (one of which will also include class content), plus three sessions for a cumulative set of water quality analyses that are linked in a group project activity. See points below. **Laboratories cannot be made up unless you arrange in advance to attend another section's lab session with instructor approval.** An absence will result in a zero grade for that lab.

A. LABORATORY MANUAL

There is no printed Laboratory Manual available for purchase in the Bookstore. All laboratory experiments and supporting materials are files located on Canvas. You are required to read, print, and bring the scheduled laboratory experiment to lab, and turn in the required Prelaboratory Assignment at the start of lab. This includes lab in the first week of the quarter, 3/29. Cascadia has a required Safety Protocol that is contained in the Introduction / Table of Contents file. **You are required to submit the signature form (p. 6) during the first laboratory period (parental signature if you are under 18).** The manual contains a tutorial for Vernier Software "Graphical Analysis." This graphing program is installed on all Cascadia computers, and this course requires that you are capable of using it for making and working with graphs by the fourth lab session.

B. SAFETY GOGGLES

Safety goggles are available at the bookstore which must be worn in the laboratory any time chemicals or glassware are in use by anyone in the lab.

C. LABORATORY NOTEBOOKS

All notes taken while in lab must be written in **ink** in your laboratory notebook. The notebook must be hardbound, similar in size to 7½" x 9¼", with either preprinted or handwritten page numbers. It should not have a flexible cover, nor removable pages, nor a spiral wire binding. You are encouraged to use your Chem 162 lab notebook.

The following items must be included in your lab notebook for each experiment:

- Title of experiment
- Date of experiment
- Page reference to manual or reference to handout.
- Statement of purpose - one or two sentences completed **before** coming to the lab
- Entries specified by the Prelaboratory assignment
- An entry in your Table of Contents
- Notes the day of lab that your instructor specifies to place in your notebook.
- Name of partner (if any) and references to co-workers' data.
- Data and notes taken during the experiment. **Do NOT** transcribe the manual, but make page references to the manual (noting any procedure changes). Your entries, taken together with the manual or handout, should enable a co-worker to understand and reconstruct your results.

During the experiment no notes should be taken in the laboratory manual or on separate sheets of paper, and all notes should be taken in the lab notebook. If an error is made in the notebook, a single line should be drawn through it and initialed by you. Other than a simple correction, **entries must be made in time-sequence**, and any additions or

changes must be made following the original entry. If you decide to repeat a procedure, leave the original entry and make a statement that you are repeating it. **Pencil or “whiteout” should never be used in a lab notebook.** At the completion of each laboratory period, your notebook must be reviewed by a classmate other than your lab partner, and submitted to your instructor for initialing. Notebooks will be graded twice during the quarter for required elements, correct format, clarity of data, organization, and entries sufficient to allow another individual to understand what you have done and reconstruct your results.

D. ARRIVING LATE TO LAB

If you arrive late to lab, you are welcome; however, if the safety and procedure briefing has been completed you may participate only as an observer and at reduced credit (60 – 80% credit).

E. LABORATORY REPORTS

Both Pre-Lab and Post-Lab reports will be required for each experiment. The Pre-Lab report contains questions designed to allow you to gain some initial understanding of the experiment. To answer the Pre-Lab questions, a thorough and thoughtful reading of the experiment must be done. While you may consult with colleagues in the class about your responses to the Pre-Lab questions, you must provide your own individual, unique answers to these questions. Because the Pre-Lab questions are designed to prepare you for the experiment, **Pre-Lab reports are due at the beginning of each laboratory session. Failure to submit a Pre-Lab report at the start of lab will result in no credit given for that Pre-Lab report.**

The Post-Lab report allows you to reflect on the data collected in each experiment and to answer questions related to the experiment. You are encouraged to collaborate with your colleagues, but submit your own individual, unique report. Laboratory reports must **not** be written in your laboratory notebook. They may include pages from the experiment file and may require additional printed or handwritten pages of your own.

Laboratory reports will normally be due by the start of the second class following lab (Friday). **Late reports will automatically lose 2 points (if within 24 hours), 4 points (if later). They will not be accepted after the class' reports have been returned (usually the next laboratory period).**

F. LABORATORY GROUP INTERACTION AND PERSONAL RESPONSIBILITY

A maximum of 20 points will be awarded for cooperative and responsible laboratory behavior. Ten points for Learning Interactively will include, but not be limited to working cooperatively and interactively with your colleagues, sharing of techniques and data, and serving as a resource for others. Ten points for Personal Responsibility will include arriving on time and prepared for lab, and observing all safety and waste disposal procedures. These include, but are not limited to having goggles and always wearing them in the lab, maintaining your drawer with clean glassware, keeping track of your assigned glassware, cleaning up at the end of the lab period, carefully dispensing chemicals and always replacing lids, and disposing of lab waste in the appropriate containers.

G. LAB GRADING:

Lab reports (2x10 pt and 5x 20 pts.) No scores will be dropped.	120 pts	Complete and correct prelab. assignment (about 20%), accuracy and precision of results (about 20%), clear presentation of data (about 10 - 20%), accuracy of calculations (about 20%), complete and correct post-laboratory questions (about 20 - 30%)..
Project Activity (3 x 10 pts)	30 pt	Brief weekly reports of activity and results. While methods will be provided, the design, execution, and reporting of results will be to a great extent student-directed. Its summary will be the content for the end-of-course presentations, which are scored separately.
Laboratory Notebooks	20 pts (2x 10 pts.)	
Group Interaction	10 pts	
Personal Responsibility	10 pts	
Lab Total	190 pts	

This total will be used as one component in calculating your overall course grade, as specified above in this syllabus; a separate laboratory grade will not be recorded on your transcript.

Tentative course schedule is on the following page.

CHEM&163 -03, Spring '17 Tentative Schedule (See Unit Syllabus for Revisions)

M	Tu	W	Th	F
	Chem 163-03 3:30 - 5:35 in CC1-010	Chem 163-03 Lab 3:30 - 6:00 in CC1-330	Chem 163-03 3:30 - 5:35 in CC1-010	
3/27/2017	3/28/2017	3/29/2017	3/30/2017	3/31/2017
	15.1, 15.2	Rate of Reaction (Part I)	15.3, 15.4, 15.5 PP1	
4/3/2017	4/4/2017	4/5/2017	4/6/2017	4/7/2017
	15.6, 15.7 PP2	Rate of Reaction (Part II)	16.1 - 16.4 PP3	
4/10/2017	4/11/2017	4/12/2017	4/13/2017	4/14/2017
	16.5, 16.6 PP4	Equilibrium	16.7, 17.1, 17.2 PP5; HW1	
4/17/2017	4/18/2017	4/19/2017	4/20/2017	4/21/2017
	PP6; Group Sheet Exam	pH and Buffers Part I	18.1, 17.3, 17.4	
4/24/2017	4/25/2017	4/26/2017	4/27/2017	4/28/2017
	18.2, 17.5, 17.6 PP7	pH and Buffers Part II	17.7, 17.8 PP8	
5/1/2017	5/2/2017	5/3/2017	5/4/2017	5/5/2017
	No Classes	Polyprotic Acids	18.3, 18.4 PP9; HW2	
5/8/2017	5/9/2017	5/10/2017	5/11/2017	5/12/2017
	PP10; Group Sheet Exam	19.1 - 19.4 and Cell Potentials Lab	19.1 - 19.4	
5/15/2017	5/16/2017	5/17/2017	5/18/2017	5/19/2017
	19.5, 19.6, 19.7 PP11	Water Quality Analyses - Methods	20.1 - 20.4, 20.6-20.8; PP12	
5/22/2017	5/23/2017	5/24/2017	5/25/2017	5/26/2017
	21.1 - 21.5 PP13	Water Quality Analyses - Samples	21.6, 21.7, 21.8; PP14; HW3	
5/29/2017	5/30/2017	5/31/2017	6/1/2017	6/2/2017
Holiday	PP15; Group Sheet Exam	Water Quality Analyses - Samples	PP16; 22.1-22.4	
6/5/2017	6/6/2017	6/7/2017	6/8/2017	6/9/2017
	Presentations	No Lab PP17; 22.5; HW4; Quiz	Presentations	