

CHE153: GENERAL CHEMISTRY II SYLLABUS**Spring 2017****INSTRUCTORS:**

Dr. Laurance Beauvais
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 Office Hours: MWF 1:00 – 2:30 pm
 T 10:00 – noon
 and by appointment

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 Office Hours: MWF 12:30 – 2:00 pm
 T 9:00 – 1:30 pm
 and by appointment

LAB COORDINATOR:

Dr. Laurance Beauvais
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LAB: (ST209)

Section 1 M 2:45 – 6:15 pm
 Section 2 T 8:00 – 11:30 am
 Section 3 T 1:30 – 5:00 pm
 Section 4 T 6:00 – 9:30 pm
 Section 5 W 2:45 – 6:15 pm
 Section 6 W 6:30–10:00 pm
 Section 7 R 8:00 – 11:30 am
 Section 8 R 1:30 – 5:00 pm
 Section 9 R 6:00 – 9:30 pm

LECTURE:

Section 1 (LA1) MWF 8:30–9:35 am
 Section 2 (LA1) MWF 11:00 am–12:05 pm
 Section 3 (LA2) MWF 8:30–9:35 am

REQUIRED BOOKS AND COURSE MATERIALS*:

1. *Textbook*: Tro, *Chemistry: A Molecular Approach Plus MasteringChemistry with eText*, Pearson, 4th Edition, ISBN-13: 9780134103976 (hardcover text), 9780134162454 (looseleaf text), or 9780134162485 (etext)
2. *Laboratory Manual*: Custom Lab Manual, ISBN: 1-319-09190-3
3. *Online Homework*: MasteringChemistry www.masteringchemistry.com (bundled with text or purchased separately)
4. *Course Website*: canvas.pointloma.edu Course: **CHE153-1 SP17 – General Chemistry II**
5. *Scientific Calculator*: Non-graphing, non-programmable calculator required for exams.
6. *Clicker*: I-Clicker 2, ISBN-13: 9781429280471
7. *Laboratory Safety Glasses and Lab Coat*: Sold in lab.

Optional Materials:

Tro, *Study Guide for Chemistry: A Molecular Approach*, Pearson, 4th Edition 2017, ISBN-13: 9780134066271. Tro, *Selected Solutions Manual for Chemistry: A Molecular Approach*, Pearson, 4th Edition 2017, ISBN-13: 9780134066288.

* These materials are used for both semesters of the General Chemistry. No new materials are required for the second semester (CHE153) if you took CHE152 last semester.

OBJECTIVES:

This is the second course in a two-semester sequence studying the general principles of Chemistry. The course is designed to teach chemical facts and theories, to provide a conceptual framework of modern chemistry and to develop laboratory skills in the practice of chemical science. Topics covered include solutions, reaction rates, chemical equilibrium (including acid-base equilibria and solubility equilibria), thermodynamics, electrochemistry, and descriptive chemistry of both non-metals and metals (including transition metals). Course includes a three and one-half-hour laboratory session each week.

LEARNING OUTCOMES:

An in depth knowledge of chemistry is critical in understanding basic and applied sciences, engineering, and medical professions as well as providing valuable insight for comprehending current events and policies.

Specifically, upon completion of this course, students will be able to:

- Demonstrate a foundational knowledge of the general principles of chemistry including the behavior of solutions, the characteristics of equilibrium (including acid/base equilibrium), the significance of free energy, the properties of electrochemistry, and structures of transition metal and their compounds.
- Solve problems related to describing basic chemical kinetics, characterizing reaction equilibrium, predicting the direction of spontaneous change, calculating electrochemical cell potentials and writing chemical equations for selected chemical reactions.
- Perform basic chemical laboratory techniques related to the topics listed above.

PREREQUISITES:

Chemistry Prerequisite: Successful completion of General Chemistry I (CHE 152), or the equivalent.

Mathematical Expectations: Math skills equivalent to those taught in pre-calculus.

COREQUISITE: CHE153L

EVALUATION:

The activities described below will contribute to your total course grade according to the following:

Hour Examinations (4)	40%
Laboratory Work	25%
Homework	10%
Quizzes and In-Class Activities	10%
Final Examination	15%

Letter grades will be assigned at the end of the course based on your percentage of total possible points, according to the following APPROXIMATE scale:

A	90 – 100%
B	80 – 90%
C	70 – 80%
D	60 – 70%
F	< 60%

(+) and (–) grades will be assigned within each bracket. There is no A+ grade.

Strategies for success in CHE153

1. While memorizing course material is very important, it is crucial that you understand the concepts presented. You will therefore be expected to demonstrate your level of understanding through homework, quizzes, and exams. Focus on recognizing patterns and learn to apply the problem solving strategies that are introduced in the book and throughout lecture.
2. Working problems is the key to success. PRACTICE, PRACTICE, PRACTICE! Work the practice problems in the book as you read the material and start homework sets early so that you can take advantage of office hours and review sessions.
3. Do not procrastinate! Assignments are designed to give you topics to practice throughout the week. You should be reviewing course material and practicing problems after every lecture.
4. Come prepared to class. The time you invest in reading the assigned sections and answering prelecture problems will be repaid in full when it comes time to study for exams.
5. Remember that we are here for you. Get help if you don't understand something, come to office hours, make an appointment, etc. Chemistry is our favorite thing to talk about and we're happy to do it any time.

Advice from recent General Chemistry students

- Read the sections assigned for each lecture beforehand. Even if you don't understand what you are reading, it will make so much sense when the instructor explains it. Doing this keeps you on top of this class and makes quizzes and tests much easier to study for.
- I advise them to start mastering chemistry assignments as soon as they are assigned. They should take advantage of office hours, too.
- Go to office hours if you don't understand something! Read the textbook - it actually helps so much to go over those examples and do them yourself. When studying for the exams, redo examples from class handouts.
- Dedicate a certain amount of time each day to reviewing in class material and go to his office hours if you are confused about anything at all.
- Pay attention and show up to class! Also read and take notes on the sections that will be covered in lecture. If you're struggling in the class or just not understanding even one thing, go to the tutoring center or office hours and really get it down.
- Stay on top from the beginning. Work on test taking strategy. Study. Exams are everything.
- Pay attention in lab, as long as you do well in lab you should be fine.
- Study hard and prioritize your time. Also, make a good relationship with the professor.
- Apply yourself and work hard. You as an individual determine your success in general chemistry.
- Take the class seriously from the very beginning. Review notes directly after class.

ADMINISTRATION:

1. **Attendance:** You are responsible for all the material covered during class. Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See [Academic Policies](#) in the Undergraduate Academic Catalog. A lab absence will result in a zero on that lab report and lab quiz.
2. The use of portable electronic devices (phones, laptops, iPods, etc.) not related to the course is not permitted in the classroom or lab.
3. **Online Homework:** Homework will be assigned regularly through MasteringChemistry (www.masteringchemistry.com course ID: CHE153SPRING2017). Successful completion of the homework is essential in mastering the course material. Late assignments will not be accepted.
4. **In-Class Activities:** In-Class activities will be assigned and collected periodically during the semester. In-class activities cannot be made up; however, the lowest in-class activity score will be discarded when final grades are computed. **iclickers will be used regularly to record in-class participation.**
5. **Exams and Quizzes:** Four exams and a comprehensive final will be given during the semester. Make-up exams will be arranged only if the instructor is contacted prior to the scheduled exam time and then only if you present an institutionally valid excuse. Unannounced quizzes will be given periodically throughout the semester. Quizzes cannot be made up; however, the lowest quiz score will be discarded when final grades are computed. *Only non-graphing and non-programmable calculators may be used for exams and quizzes.*
6. **Laboratories:** Laboratory sections will meet on a weekly basis. Attendance is mandatory at all laboratory sessions. If you must miss a lab for a valid reason, you should make prior arrangements with the lab coordinator to ascertain if you can attend another lab section. No other shifts in lab schedules will be permitted. There will be no opportunity to make up missed labs. Furthermore, you are responsible for all the material covered in the lab even if you did not attend. Some experiments will be done individually, while others are best worked in pairs. Your lab instructor will specify when you work in pairs. In either case, individual lab reports will be submitted at the end of each period. A quiz, given at the beginning of each lab period, is designed to test individual understanding of the current and previous experiments.
7. **Canvas:** Canvas (canvas.pointloma.edu) is used as a repository for course material such as lecture notes, slides, and miscellaneous items. Announcements will be sent out via Canvas. It is your responsibility to check Canvas regularly and to confirm that your correct email address is in the system. Grades will be posted periodically to Canvas.

OTHER MATTERS:

Academic Accommodations Policy: If you have a diagnosed disability, please contact PLNU's Disability Resource Center (DRC) within the first two weeks of class to demonstrate need and to register for accommodation by phone at 619-849-2486 or by e-mail at DRC@pointloma.edu. See [Disability Resource Center](#) for additional information.

Academic Honesty Policy: Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See [Academic Policies](#) for definitions of kinds of academic dishonesty and for further policy information.

Final Examination Policy: Successful completion of this class requires taking the final examination **on its scheduled day**. The final examination schedule is posted on the [Class Schedules](#) site. No requests for early examinations or alternative days will be approved.

PLNU Copyright Policy: Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

PLNU Mission: Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

GENERAL CHEMISTRY II (CHE 153) SPRING 2017 CLASS SCHEDULE

<u>DATE</u>	<u>TOPIC</u>	<u>READING ASSIGNMENT</u>
Jan 10 (T)	Properties of Solutions	Chapter 13.1 – 13.2
Jan 11 (W)	Factors Affecting Solubility	Chapter 13.3 – 13.4
Jan 13 (F)	Expressing Solution Concentration	Chapter 13.5
<i>Jan 16 (M)</i>	<i>Martin Luther King Holiday</i>	
Jan 18 (W)	Colligative Properties	Chapter 13.6 – 13.7
Jan 20 (F)	Reaction Rates	Chapter 14.1 – 14.3
Jan 23 (M)	Integrated Rate Law and Effect of Temperature	Chapter 14.4 – 14.5
Jan 25 (W)	Collision Theory and Reaction Mechanisms	Chapter 14.5 – 14.6
Jan 27 (F)	Catalysis	Chapter 14.7
Jan 30 (M)	Principles of Chemical Equilibrium	Chapter 15.1 – 15.5
Feb 1 (W)	Equilibrium Calculations	Chapter 15.6 – 15.7
Feb 3 (F)	EXAM 1 (Chapter 13, 14, 15a)	
Feb 6 (M)	Equilibrium Calculations & Le Chatelier's Principle	Chapter 15.8 – 15.9
Feb 8 (W)	Le Chatelier's Principle	Chapter 15.9
Feb 10 (F)	Nature of Acid and Base	Chapter 16.1 – 16.4
Feb 13 (M)	pH Calculations and Acid/Base Strength	Chapter 16.5 – 16.6
Feb 15 (W)	Bases, Salts, and Polyprotic Acids	Chapter 16.7– 16.9
Feb 17 (F)	Acids Strength and Molecular Structure	Chapter 16.10 – 16.11
Feb 20 (M)	Common Ions and Buffers	Chapter 17.1 – 17.3
Feb 22 (W)	Titration Principles	Chapter 17.4
Feb 24 (F)	pH Curves and Indicators	Chapter 17.4
Feb 27 (M)	Solubility Equilibria	Chapter 17.5 – 17.6
Mar 1 (W)	Complex Ion Equilibria	Chapter 17.7 – 17.8
Mar 3 (F)	EXAM 2 (Chapters 15b, 16, and 17)	

<u>DATE</u>	<u>TOPIC</u>	<u>READING ASSIGNMENT</u>
<i>Mar 6 – 10</i>	<i>Spring Mid-Term Break</i>	
Mar 13 (M)	Spontaneity, Entropy, and 2 nd Law	Chapter 18.1 – 18.3
Mar 15 (W)	Free Energy – The Concept	Chapter 18.4 – 18.5
Mar 17 (F)	Free Energy and Chemical Reactions	Chapter 18.6 – 18.7
Mar 20 (M)	Free Energy and the Equilibrium Constant	Chapter 18.8 – 18.9
Mar 22 (W)	Free Energy and the Equilibrium Constant	Chapter 18.8 – 18.9
Mar 24 (F)	Half Reactions and Galvanic Cells	Chapter 19.1 – 19.3
Mar 27 (M)	Cell Potential and Free Energy	Chapter 19.4 – 19.5
Mar 29 (W)	Cell Potential and Concentration Effects	Chapter 19.6 – 19.7
Mar 31 (F)	Electrolysis and Corrosion	Chapter 19.8 – 19.9
Apr 3 (M)	Electrolysis and Corrosion	Chapter 19.8 – 19.9
Apr 5 (W)	EXAM 3 (Chapters 17 and 18)	
Apr 7 (F)	Coordination Compounds and Isomers	Chapter 25.1 – 25.4
Apr 10 (M)	Metal-Ligand Bonding and “d” Orbitals	Chapter 25.5 – 25.6
Apr 12 (W)	Metal-Ligand Bonding and “d” Orbitals	Chapter 25.5 – 25.6
<i>Apr 14 (F)</i>	<i>Easter Break</i>	
<i>Apr 17 (M)</i>	<i>Easter Break</i>	
Apr 19 (W)	Properties of the Main Group Elements	Chapter 23.1 – 23.4
Apr 21 (F)	Carbon Compounds and the Nitrogen Family	Chapter 23.5 – 23.6
Apr 24 (M)	Oxygen Family and the Halogen Compounds	Chapter 23.7 – 23.9
Apr 26 (W)	Metals and Metallurgy	Chapter 24.1 – 24.4
Apr 28 (F)	EXAM 4 (Chapters 23, 24, and 25)	
May 3 (4:30 – 7:00 pm)	ACS COMPREHENSIVE FINAL EXAM (COVERS ALL TOPICS IN CHE 152 & 153) (See Final Exam Schedule)	

GENERAL CHEMISTRY II (CHE 153)
Spring 2017
Laboratory Schedule

SESSION	DATES (M,T,W,R)	EXPERIMENTS
1	Jan 17 – 20*	Colligative Properties: The Molar Mass of a Soluble Substance by Freezing-Point Depression (p. 165)
2	Jan 23 – 26	Chemical Kinetics (Handout)
3	Jan 30 – Feb 2	Gas Phase Equilibrium (Handout)
4	Feb 6 – 9	Some Example of Chemical Equilibria: Le Châtelier's Principle (p. 176)
5	Feb 13 – 16	Determination of the Molar Mass and Ionization Constant of a Weak Acid (p. 186)
6	Feb 20 – 23	Weak Acids and Hydrolysis (Handout)
7	Feb 27 – 30	The Solubility Product Constant of Calcium Iodate, $\text{Ca}(\text{IO}_3)_2$ (p. 196)
8	<i>Mar 6 – 9</i>	<i>Spring Mid-Term Break – No Lab</i>
9	Mar 13 – 16	Qualitative Analysis Part I (Handout)
10	Mar 20 – 23	Equilibrium, Free Energy and Entropy (Handout)
11	Mar 27 – 30	Electrochemical Cells and Electrolysis (Handout)
12	Apr 3 – 6	Qualitative Analysis Part II (Handout)
13/14	Apr 10 – 20**	Transition-Metal Complexes (Handout)
15	Apr 24 – 27	Ligand Field Spectra of Copper(II) Complexes (Handout)

*Monday lab section meets on Friday this week

**Monday and Tuesday sections will meet before Easter recess. Wednesday and Thursday sections meet after Easter recess