College Chemistry II

CH 122 – Winter 2019

CRN: 33543 Lecture: M, W – F 1:00 – 1:50 PM (IA 212)
CRN: 33857 Lab: Tu 8:00 – 10:50 AM (MH 206)
CRN: 33858 Lab: Tu 11:00 AM – 1:50 PM (MH 206)

Instructor: Ommidala Pattawong, Ph.D. **Contact:** pattawo@linnbenton.edu or 541-917-4625

Office: Madrone Hall 209 **Office Hours:** Mon 11 AM – 12 PM and 2 – 3 PM

Course Information:

The second of a three term college chemistry sequence for students in human performance, certain health occupations programs, agriculture, animal science, and fisheries and wildlife. This sequence is for students who have had no previous training in chemistry and whose program of study requires only a one-year sequence of college chemistry. Topics include atomic structure, periodic trends, covalent and ionic bonding, atomic and molecular orbital theory, phase changes, colligative properties, intermolecular forces, and organic chemistry. Students are advised to investigate and understand the degree requirements at the university where they intend to transfer. (Note - this sequence is not equivalent to General Chemistry. CH 121 does not fulfill the Baccalaureate Core requirements at OSU, however the next two courses in the series, CH 122 and CH 123, fulfill Baccalaureate Core requirements at OSU.) CH 121, CH 122, CH 123 must be taken in order. Prerequisites: MTH 111 College Algebra and CH 121 College Chemistry, both with a grade of "C" or better. Corequisite: CH 122L College Chemistry II Lab.

Student Learning Outcomes:

1. Solve scientific problems with quantitative methods regarding electromagnetic radiation, chemical bonding, phase changes, and colligative properties.
2. Apply chemical principles related to quantum mechanics, atomic and molecular orbital theory, periodic trends, intermolecular attractions of pure substances and solutions, covalent bond theory, and organic chemistry.
3. Work safely in a laboratory environment while observing and accurately recording measurements related to chemical phenomena.

Minimum Requirements:

MTH 111 and CH 121, or CH 201, or CH 221 with a grade of C or better.

Workload Expectation:

Students taking chemistry courses are expected to work a minimum of 3 hours of work per week outside of class for every credit hour. Examples of outside work include reading, review lecture materials, study time, practice problems, homework assignments, and doing lab assignments.

Required Course Materials (Available for you to purchase at the bookstore):

1. Principles of Chemistry: A Molecular Approach, 3rd Ed., Tro. *(The 1st and 2nd editions are okay. Note that the pages will be different from what lecture refers to.)*
2. Access Code for Knewton Alta Online Homework *(The access code from last term works.)*
3. Bound Laboratory Notebook with numbered pages and carbonless copies.
4. Non-graphing/non-programmable Scientific Calculator (TI 30xa). Students will be required to use a non-graphing/non-programmable scientific calculator for quizzes and/or exams.

Optional Course Materials (Available for you to purchase at the bookstore):

1. Lab coat
2. Personal Safety Goggles

Attendance and Classroom Decorum:

Class attendance and participation are very important to be successful in the learning of chemistry. Students are expected to attend class regularly, on time, and engage in activities and/or discussions. Students should avoid entering the classroom late or leaving before the class ends, as it is distracting to students and instructors. Students are required to turn off their cell phones during class periods. **If a student needs to use a cell phone (call or text) they are expected to leave the classroom to do so.** The use of a laptop computer during lecture and lab are only allowed for assigned course materials, i.e. lecture is not a time to do homework.

Grade Assessments: Your grade will be assigned based on your performance in the following areas:

Best 9 out of 10 lab reports	9 x 14 pts = 126 pts (21%)
Online homework	6 x 10 pts = 60 pts (10%)
In-class activities (6 pt each) & learning assessments (20 pt each)	234 pts (39%)
Final Exam	180 pts (30%)
Total	**600 pts** (100%)

Course Grade: Assignment of course grades will follow an approximate breakdown of

- A = 90-100% Excellent Work
- B = 80-89% Good Work
- C = 70-79% Average Work
- D = 60-69% Poor Work
- F = 0-59% Failing Work

An incomplete grade (I) may be given at the discretion of the instructor. However, a student must have a passing grade at the time an incomplete is assigned.

Exam Policies:

All exams are given in class. Examinations must be taken at the scheduled time unless **prior** arrangement is made. Students who have conflicts with exam days due to other College functions, illness, or family emergencies must contact the instructor **prior** to the exam. Documentation of the College function, illness and/or family emergency must be provided to schedule a make-up exam. "My alarm did not go off" or "My car would not start" are not valid excuses. Leave early and have a plan B. Transporting oneself to class on-time is the responsibility of every student who chooses to take part in an adult learning environment.

Any academic dishonesty during any exams including cheating, using electronic devices, cell phones, lecture materials, or books that are not permitted, will result in a score of ZERO for the exam!

The final exam is comprehensive. You may bring one 3" x 5" notecard with notes on both sides to the final exam. A missed final exam will receive a score of zero. **The final exam will be given on Wednesday, March 20th 1:00 – 2:50 PM in MH 208**

Exam Re-Grade Request:

All exam re-grade requests must be submitted in writing to a course Instructor within one week of the exam being returned to students. The entire exam will be re-graded for accuracy. The re-grade request will be compared against a photocopy of the originally graded exam. Note: Arithmetic errors will be corrected immediately and are not considered re-grade requests.

In-Class Activities (ICAs) and Learning Assessments (LAs):

Student's participation and engagement are essential part of learning. In this course, students are expected to attend every lecture and participate in group-work ICAs as well as take individual LAs. On Friday of every week, students will spend the first 15 minutes of class time to practice problem sets and discuss with their peers. For the last 30 minutes of class time, students will complete the LA individually without the help from their peers. The ICAs and LAs are designed as an active learning approach and to evaluate student's understanding of the materials that they have learned from the previous week. Each ICA is worth 6 points. Each LA is worth 20 points. Total of 234 points can be earned from ICAs and LAs.

Online Homework:

To succeed in chemistry, like learning a foreign language, you should study and practice every day. As material is covered you will find the problems are easier to work and not as time consuming as if they are attempted just before the due date. Refer to the schedule for homework due dates. You can access **Knewton Alta Online Homework** via Moodle site. Each homework assignment is worth 10 points. Homework is due by 11:59 pm on the dates listed in the lecture schedule.

NOTE: This homework is adaptive to each learner. If you don't get consecutive answers, the system will think that you have not mastered in a particular topic; therefore, it will throw more problems at you. If this happens, please get help from your instructor to avoid frustration.

For late homework, students can turn in completed assignments after the due date up to 2 days late. However, students will received a deducted 5% penalty from the completed scored per day late.

For your first time doing homework, the Knewton Alta Online Homework will prompt you to enter access code. You can purchase this access code online or at the LBCC bookstore. Knewton Alta offers a grace period on payment; for most courses, this is 14 days from the first day of the term.

Laboratory Exercise:

The laboratory experience is a vital part of this course. Students are expected to attend the laboratory at their scheduled time. Failure to complete the laboratory work or to hand in all of the assigned laboratory reports may result in a lowered grade. **You must receive at least 70% of the total lab points in order to pass the course regardless of passing the lecture. Also, if you miss more than three labs or turn in fewer than five reports you will not receive a passing grade for the course.** No make-up labs will be given.

Extra Credit:

1. *Lab Exercise Completion:* If you turn in ALL of your lab exercises, your lowest lab score will be dropped, and it will be used as extra credit.

2. *Mini Exam Reflection:* Students who submit the exam reflection for their mini exam 1 and 2, and 3 are eligible for 6 extra credit points (2 points for each exam correction). The exam reflection will give you a chance to reflect on your exam performance and, more importantly, on the effectiveness of your exam preparation. The exam reflection will be given in class as well as posted on Moodle. You will answer the questions sincerely for these extra credits. Please see course schedule for the exam reflection deadline.

Resources:

Your success is very important to me! I encourage you to seek help from one or more of the following resources:

1. Instructor office hours (see the front page for days, times and locations)
2. Ask questions during lecture (or immediately before/after lecture)
3. Science Help Desk
4. Academic Support (http://linnbenton.edu/future-students/academic-support/)

Science Help Desk:

The Science Help Desk is located on the first floor of Madrone Hall in the atrium area. The Help Desk is staffed approximately 20 hours per week. Hours of the Help Desk are posted in the Help Desk area and throughout Madrone Hall.

Tips for Success:

- Attend every lecture, and lab session, and come prepared!
- Review lecture notes after lecture; clarify confusing points immediately
- Doing homework problems regularly
- Form a study group; take turns "teaching" each other concepts/problems
- Use your lecture notes to guide your studying
- The homework problems should be considered the minimum number of problems to do to ensure success
- Repeat homework problems and/or worksheet problems until you can do them quickly, without looking at any notes or answer keys
- Address problems as they arise. The sooner you attempt to resolve an issue, the better!

Drop/Withdraw Policy:

If you are withdrawing from the class you must file a Schedule Change Form with Registration or use WebRunner. If you formally drop the class by Monday of the second week of the term, you will receive a tuition refund. If you withdraw after the Monday of the second week of instruction through the seventh week a 'W' will show up on your transcript. No withdrawals are allowed after the end of the seventh week. An instructor may not assign a "W" grade.

If you received financial aid or veteran's benefits PLEASE talk with associates at the appropriate office to determine what effects on eligibility dropping a course will have. Don't jeopardize your eligibility!! You can contact the Financial Aid Office by calling (541) 917-4850 or by visiting the Financial Aid Office in Takena Hall.

If you stop attending the course without formally withdrawing you will continue to accumulate grades (zeroes for all assignments not turned in) and will receive the grade assigned by the instructor. You will also be held accountable for all charges on your account.

Academic Integrity:

"An instructor has the right to issue a grade of F for the course in which the instructor has reason to believe the student has cheated. A student has the right to appeal such action in accordance with the Students' Rights, Responsibilities and Conduct Policy." The preceding statement is Administrative Rule No. 7030-02.

LBCC Comprehensive Statement of Nondiscrimination:

LBCC prohibits unlawful discrimination based on race, color, religion, ethnicity, use of native language, national origin, sex, sexual orientation, gender, gender identity, marital status, disability, veteran status, age, or any other status protected under applicable federal, state, or local laws. For further information see Board Policy P1015 in our Board Policies and Administrative Rules.

Center for Accessibility Resources:

You should meet with your instructor during the first week of class if:

1. You have a documented disability and need accommodations.
2. Your instructor needs to know medical information about you.
3. You need special arrangements in the event of an emergency.

If you have documented your disability, remember that you must make your request for accommodations through the Center for Accessibility Resources Online Services web page every term in order to receive accommodations. If you believe you may need accommodations but are not yet registered with CFAR, please visit the CFAR website at www.linnbenton.edu/cfar for steps on how to apply for services or call 541-917-4789.

Changes to the Syllabus:

I reserve the right to change the contents of this syllabus due to unforeseen circumstances. You will be given notice of relevant changes in class, through a Moodle Announcement, or through LBCC e-mail.

Lecture Schedule

**Note: This schedule of topics, homework due dates, and exam dates is subject to change.
All homework assignments are due by 11:59 pm on the date indicated in the lecture schedule.

Course Content

Chapter 8 Periodic Properties of the Elements
- 8.2 – The development of the periodic table
- 8.3 – Electron configurations: how electrons occupy orbitals
- 8.4 – Electron configurations, valence electrons, and the periodic table
- 8.5 – The explanatory power of the quantum mechanical model
- 8.6 – Periodic trends
- 8.7 – Ions: electron configurations, magnetic properties, ionic radii, and I.E.
- 8.8 – Electron affinities and metallic character

Chapter 9 Chemical Bonding I: The Lewis Model
- 9.2 – Types of chemical bonds
- 9.3 – Representing valence electrons with dots
- 9.4 – Ionic bonding: Lewis symbols and lattice energies
- 9.5 – Covalent bonding: Lewis structures
- 9.6 – Electronegativity and bond polarity
- 9.7 – Lewis structures of molecular compounds and polyatomic ions
- 9.8 – Resonance and formal charge
- 9.9 – Exceptions to the octet rule
- 9.10 – Bond energies and bond lengths
- 9.11 – Bonding in metals

Chapter 10 Chemical Bonding II: VSEPR, VBT, and MOT
- 10.2 – VSEPR: the five basic shapes
- 10.3 – VSEPR: the effect of lone pairs
- 10.4 – VSEPR: predicting molecular geometries
- 10.5 – Molecular shape and polarity
- 10.6 – VBT: orbital overlap as a chemical bond
- 10.7 – VBT: hybridization of atomic orbitals
- 10.8 – MOT: electron delocalization

Chapter 11 Solids, Liquids, and IMFs
- 11.2 – Solids, liquids, and gases: a molecular comparison
- 11.3 – IMFs: the forces that hold condensed states together
- 11.4 – IMFs: surface tension, viscosity, and capillary action
- 11.5 – Vaporization and vapor pressure
- 11.6 – Sublimation and fusion
- 11.7 – Heating curve for water
- 11.8 – Phase diagrams
- 11.9 – Water: an extraordinary substance

Chapter 12 Solutions
- 12.2 – Types of solutions and solubility
- 12.3 – Energetics of solution formation
- 12.4 – Solution equilibrium and factors affecting solubility
- 12.5 – Expressing solution concentration
- 12.6 – Colligative properties: vapor pressure lowering, freezing point depression, boiling point elevation, and osmotic pressure
- 12.7 – Colligative properties of strong electrolyte solutions

Add^{n} Topic Introduction to organic chemistry
- Organic Compounds
- Organic nomenclature
- Organic functional groups

Lecture Schedule

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Week No.	LECTURE	LAB	LECTURE		
	Mon.	Tues.	Wed.	Thurs	Fri.
1 (1/7-1/11)	Syllabus Review Chapter 7	*Lab 1: Safety Activities*	8.2 – 8.3	8.3 – 8.4	8.4 – 8.5
2 (1/14-1/18)	8.5 – 8.6 **HW Ch 8 Part 1 Due**	*Lab 2: Scientific methods & Tools*	8.6 – 8.7	8.7 – 8.8	*ICA & LA 1*
3 (1/21-1/25)	*No Class* **HW Ch 8 Part 2 Due**	*Lab 3: Periodic trends*	9.2 – 9.4, 9.11	9.5, 9.10	*ICA & LA 2*
4 (1/28-2/1)	9.6 – 9.7 **HW Ch 9 Part 1 Due**	*Lab 4: Lewis Structure Workshop (9.7, 9.8)*	9.9	10.2 – 10.4 (candy geometry)	*ICA & LA 3*
5 (2/4-2/8)	10.6 – 10.7 **HW Ch 9 Part 2 Due**	*Lab 5 Geometry & Polarity Workshop (10.5)*	10.6 – 10.7	10.8	*ICA & LA 4*
6 (2/11-2/15)	11.2 – 11.3 **HW Ch 10 Due**	*Lab 6 Chromatography in Fruit Juice Analysis*	11.4 – 11.5	11.5 – 11.6	*ICA & LA 5*
7 (2/18-2/22)	*No Class* **HW Ch11 Part 1 Due**	*Lab 7 Instant Cold & Hot Packs*	11.6 – 11.7	11.8 – 11.9	*ICA & LA 6*
8 (2/25-3/1)	12.2 – 12.3 **HW Ch11 Part 2 Due**	*Lab 8 Colligative Property of Fatty Acids*	12.4 *(hot ice demo)*	12.5	*ICA & LA 7*
9 (3/4-3/8)	12.6 – 12.7 **HW Ch12 Part 1 Due**	*Lab 9 From Waste to Wash*	12.6 – 12.7	12.6 – 12.7	*ICA & LA 8*
10 (3/11-3/15)	Introduction to Organic Chemistry **HW Ch12 Part 2 Due**	*Lab 10 From Fat to Fuel*	Organic compounds: Nomenclature & Functional Groups	Organic compounds: Nomenclature & Functional Groups	*ICA & LA 9* **HW O-Chem Due**

Final Exam:

Wednesday, March 20th 1:00 – 2:50 PM in MH 208