COURSE TITLE: CH 202 Chemistry for Engineering Majors II **CREDITS:** 5

LAB INSTRUCTOR: Omid Sadeghihosseinabadi, Ph.D. **Lab CRN**: 43652, 43653

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LECTURE INSTRUCTOR: Brian Reed, Ph.D. **Lecture CRN**: 40591

EMAIL: reedb@linnbenton.edu (best method of contact)

OFFICE: IA-204 (not used this term)

PHONE: 541-917-4622 (office line checked once weekly)

VIRTUAL OFFICE HOURS (TENTATIVE):

Tuesdays 10:00-11:00 AM Thursdays 11:00-12:00 PM Fridays 12:00-1:00 PM
*And by appointment though ZOOM (contact via email to schedule)

INSTRUCTOR WEBSITE:

Go to www.linnbenton.edu. Click QuickLinks, click Instructor Website, click Reed, Brian.

Course Description:

The second of a two-term sequence designed specifically to provide engineering majors with a fundamental understanding of chemical reactions and scientific measurement. This course will introduce students to principles, laws and equations that govern our understanding of chemical combination.

Prerequisite:

CH 201 Chemistry for Engineering Majors I and MTH 111 College Algebra with a grade of C or better. This course includes a laboratory component.

Required Materials:

Textbook: *Chemistry: The Molecular Nature of Matter and Change, 8th Ed.,* Silberberg (One of the older 4th, 5th, 6th, or 7th editions is also acceptable, and are relatively inexpensive)

Course Outcomes:

Upon successful completion of this course, students will be able to:

1. Solve engineering-related scientific problems with quantitative methods regarding phase changes, rates of reactions, and chemical equilibrium.
2. Solve engineering-related scientific problems with quantitative methods involving thermodynamics and electrochemistry.

3. Apply chemical principles related to quantum mechanics, atomic orbital theory, periodic trends, and covalent bond theory.
4. Apply chemical principles related to chemical kinetics, equilibrium, thermochemistry, and electrochemistry.
5. Work safely in a laboratory environment while observing and accurately recording measurements related to chemical phenomena.

Exams:
Due to the need to move this course to an online format for Spring term, all exams will be considered open book and open notes. You may use all materials provided for the course through the CH 202 course page, but I ask that you do not use internet resources or consult with your classmates. Exam dates and coverage will be posted in advance on the course schedule page as the term progresses.

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. Keep in mind a typical science course takes 3-4 hrs of work per week outside of class for every credit hour. Given the transition to an online delivery of the course it will be critical that you keep up with the material and work problems every day.

Refer to the schedule for homework due dates and times. Each problem will be checked for a reasonable attempt at solving, and be graded not only the solution, *but the effective communication of the solution process.*

Late homework will not be accepted without prior arrangement. Solutions to the homework sets will be available shortly after the due date, and homework received after solutions are posted will not be taken for credit.

Laboratory Experiments and Reports:
Laboratory experiments for CH 202 will be delivered through Moodle this term. Each week on Thursday a new lab section will be uploaded to Moodle consisting of a lab procedure, a short pre-lab assignment, and a video demonstration and discussion of the experiment. Students should read the lab procedure and then complete and submit the pre-lab assignment. They should then watch the videos making note of the experimental data provided. Using the experimental procedures provided in the instructions and the data contained in the video, students will complete a lab report and set of supplementary questions.

The report and questions will then be submitted to the lab instructor through Moodle. Reports will be due one week after the lab becomes available, and late submissions will not be accepted. The report must be in PDF format which can be accomplished using 'Adobe Scan', 'CamScanner', 'Google Drive' or any other free app for making PDFs. The text of the report can be typed if you like. You can either hand-write your calculations (preferred) or use an equation editor. Please do not type equations using normal text.

Grading:

Lecture		
Section Exams	5 x 50	250 pts.
Homework Sets	10 x 12	120 pts.
Lab		
Laboratory Reports	9 x 20	180 pts.
Total		550 pts.

90-100% A, 80-89.9% B, 70-79.9% C, 60-69.9% D, < 59.9% F

Expectations:

I expect that my students will be involved in class. This would normally mean being present and prepared, having done the reading ahead of time, asking questions in class, etc. Now that we are moving to an asynchronous, on-line format it will be challenging to make sure everyone is on the same page and working through things at the same pace. I won't be able to get immediate feedback from you, and it will be harder for me to sense when people are getting stuck.

I ask that you be proactive in reaching out for help when you need it and that you work with this material every day so it doesn't pile up on you. This material is challenging, and it takes some time to digest. I'll expect you to read your textbook and work problems as well as follow along with the lectures. You cannot learn this effectively just by watching videos or looking at examples. Doing this remotely will be a challenge, but we can make this work!

How to be successful in this class:

- Even though this term classes are delivered remotely, make a school schedule and stick to it!
- Be prepared for class by reading the assigned materials promptly when asked. Class lectures will be richer for you when you have background information about the subject.
- Review the syllabus and learn policies and procedures for this class. Understand your rights and responsibilities as a student and as a class member.
- When confused, challenged, frustrated or having an "aha" moment, contact the instructor during their 'virtual' office hours or via email.
- Don't hesitate to ask questions, whether during 'virtual' office hours or through email. Your instructors are here to help you succeed, stay connected with them!
- Be engaged! You will get out of this class what you put into it. This will be a challenge with the online format adopted this term.

Course Evaluations:

Student feedback is important to improve this course and to help the instructor know how to adjust teaching methods. Your feedback is taken seriously and does impact future versions of the course. The Student Evaluations of Teaching (SETs) are anonymous, and links to the form will be emailed to you after the 6th week of the class. The process takes approximately 10 minutes and I encourage you take this opportunity to provide constructive feedback on the class. Thank you in advance for your input!

Academic Integrity:

It is understandable that you will discuss your homework and other assignments with your classmates and that is fine, but you are expected to write up your own results, whether it is on paper or using a spreadsheet or other program. I assume that you are ethical and honest. However, if there is an incident of academic dishonesty (cheating), which includes sharing computer files, you will receive a score of zero for that assignment/test and the incident will be reported to the college administration for possible further disciplinary action. If there is a second offense, you will receive a grade of F for the course and the incident will be reported to the college administration with a recommendation for disciplinary action.

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.

Nondiscrimination and Non-Harassment:

Linn-Benton Community College is committed to providing an atmosphere that encourages individuals to realize their potential. We embrace diversity and inclusion of all persons. The college prohibits unlawful discrimination based on race, color, religion, ethnicity, use of native language, national origin, sex, sexual orientation, marital status, disability, veteran status, or age in any area, activity or operation of the college. In addition, the college complies with related federal, state, and local laws (Civil Rights, Disability & Rehabilitation Acts, Veterans Acts).

LBCC is committed to providing equal opportunity in all of its programs, policies, procedures, and practices, and the college shall promote equal opportunity and treatment through application of this policy and other college efforts designed for that purpose. For further information see Administrative Rule No. 1015-01 at http://po.linnbenton.edu/BPsandARs/

Center for Accessibility Resources:

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

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

If you believe you may need accommodation services, please contact the Center for Accessibility Resources (541) 917-4789. 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.

Veterans and active duty military personnel with special circumstances are welcome and encouraged to communicate these, in advance if possible, to the instructor.

Students Rights, Responsibilities, and Conduct Policy:

LBCC students have rights: the right to free speech, the right to assemble, the right of a free press, etc. LBCC students also have responsibilities to their community: the responsibility to participate and engage in class, the responsibility to advocate for their needs (ask for help), the responsibility to support a respectful teaching and learning environment, the responsibility to treat all persons with respect, the responsibility to be truthful and honest in all work and communications, and the responsibility to follow staff directions, local, state, and federal laws. Rights and responsibilities balance together to create the best learning environment. For example, while you have free speech in the café or courtyard, in class the instructor decides whose turn it is to talk and what the topics for conversation will be. Students are free to believe what they believe, but instructors may require students to learn and recite concepts, principles, or theories for a class even if the student does not believe those concepts. You play a role in creating a positive community at LBCC. Please review your rights and responsibilities at this link: www.linnbenton.edu/go/studentrights.

If you believe a student is violating your rights, ask to be treated with respect. If that does not resolve the situation, report to Associate Dean Dr. Lynne Cox, Takena 107. If you believe a faculty member or LBCC employee is violating your rights, please report to Human Resources, Scott Rolen, CC-108.
In cases of immediate danger, report to Public Safety, Red Cedar Hall (RCH-119), 541-926-6855. (We encourage all students to enter this Public Safety phone number into their cell phone.)

Personal Empowerment Through Self-Awareness:

LBCC is launching a new training called “Personal Empowerment Through Self-Awareness.” This training is an online video series on dating, sexual consent, and on preventing sexual violence or partner violence. Every student has a right and healthy learning climate. Every new student is required by federal law to complete this training to learn how to safeguard yourself and others from sexual assault. We ask students to watch for email notification and to ensure that they complete this new training. (For example, do you know the number one date rape drug? It’s not what you think! Check out the training.) This online series reviews federal and Oregon law and is designed for your safety. The training will also direct you how to report dating, sexual, or partner violence to LBCC officials.
Note: The instructor reserves the right to make changes to the course syllabus and schedule.

	*Day 1	*Day 2	*Day 3	*Day 4	Laboratory	Homework
Week 1 4/6	Syllabus Review of Ch. 7	8.1 8.2	8.3 8.4	8.4 9.1	Experiment #1: Atomic Spectra	*Ch 8 HW Due **Sun** (4/12)*
Week 2 4/13	9.1 – 9.3	9.4 9.5	9.5 10.2	10.2 10.3	Experiment #2: Periodic Trends	*Ch 9 HW Due **Sun** (4/19)*
Week 3 4/20	10.3 12.1	12.1 12.2	12.2 – 12.4	**Exam I Chapter 8,9,10**	Experiment #3: Lewis Structures and Molecular Models	*Ch 10 HW Due **Wed** (4/22)*
Week 4 4/27	12.4 12.5	13.1 13.3	13.3 13.4	13.4 13.5	Experiment #4: Enthalpy of Vaporization of Water	*Ch 12 HW Due **Wed** (4/29)*
Week 5 5/4	13.5	16.1 16.2	16.3 16.4	**Exam II Chapter 12, 13**	Experiment #5: Freezing Point Depression	*Ch 13 HW Due **Wed** (5/6)*
Week 6 5/11	16.4 16.5	16.5 16.7	16.7 17.1	17.1 17.2	Experiment #6 The Iodine Clock	*Ch 16 HW Due **Fri** (5/15)*
Week 7 5/18	17.3 - 17.4	**Exam III Chapter 16**	17.5	17.6 18.1	Experiment #7: Le Chatelier's Principle	*Ch 17 HW Due **Sun** (5/24)*
Week 8 5/25	18.1	18.2 18.3	18.4	20.1 20.2	Experiment #8: Solubility and Thermodynamics	*Ch 18 HW Due **Sat** (5/30)*
Week 9 6/1	**Exam IV Chapter 17 & 18**	20.2 20.3	20.4 21.1	21.1 21.2	Experiment #9: Electrochemistry	*Ch 20 HW Due **Sat** (6/6)*
Week 10 6/8	21.2 21.3	21.4	21.5	**Exam IV Chapter 20 & 21**		*Ch 21 HW Due **Thu** (6/11)*

***Note:** Because the course is being delivered asynchronously, there are no specific days linked to topics. However, I wanted to provide a sense of pacing, and give you a general idea of where you should be in the material as we move through the term. Dates for exams will be posted on the course schedule page.

****Note:** **This schedule of topics, homework due dates, and exam dates is tentative, and subject to change at the instructor's discretion.**