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Instructor Information	Error! Bookmark not defined.
Name:.....	Error! Bookmark not defined.
Phone	Error! Bookmark not defined.
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Course Information

Course Title: Gen College Chem II/Lab: SC1

Course Prefix, Number & Section:

Credits: 5

Course Description: Presents concepts in the areas of solution properties, chemical kinetics, chemical equilibrium, acid-base and ionic equilibrium, thermodynamics, and electrochemistry. This course emphasizes problem solving skills and descriptive contents for these topics. Laboratory experiments demonstrate qualitative and quantitative analytical techniques.

Guaranteed Transfer (GT) Pathways Course Statement: The Colorado Commission on Higher Education has approved CHE 112 for inclusion in the Guaranteed Transfer (GT) Pathways program in the GT- SC1 category. For transferring students, successful completion with a minimum C- grade guarantees transfer and application of credit in this GT Pathways category. For more information on the GT Pathways program, go to <http://highered.colorado.gov/academics/transfers/gtpathways/curriculum.html>.

Prerequisite(s)/Co-requisites: CHE 111

Semester and Year: Spring, 2017

Meeting Location, Times, and Days: WRECT 106, 9:15-10:30 am, MWF and WRECT 110, 7:25-9:05 am, TR

Start Date: January 8, 2018

End Date: May 2, 2018

Last date to drop with a refund: January 23, 2018

Last date to withdraw: April 11, 2018

Date and Time of Final Exam: Part 1 – Tuesday May 1, 2018 7:45-9:45 am, Part 2 – Wednesday May 2, 2018 7:45-9:45 am

Instructor Information

Name: Jay McLaughlin

Phone: 970-675-3254

E-mail: jay.mclaughlin@cnc.edu

Office Location: WRECT 119

Office Hours: MW 12:45-2:00, TR 9:15-10:30

Course Information

The instructor reserves the right to make changes to the course and course policies. Any changes will be noted in the addendum.

Required Course Materials

Chemistry a Molecular Approach, 4th edition, Pearson/Prentice Hall, ISBN-10: 0-13-4-11283-0, ISBN-13: 978-0-13-4-11283-1

Lab Book: Chemistry 112 Lab Book (available in the bookstore only)

HW Packet: Chemistry 112 Homework Packet (available in the bookstore only)

Scientific Calculator

Access to www.chemhaven.org/che112

NATURAL & PHYSICAL SCIENCES (N&PS) CONTENT CRITERIA – GT-SC1

1. The lecture content of a GT Pathways science course (GT-SC1)
 - a. Develop foundational knowledge in specific field(s) of science.
 - b. Develop an understanding of the nature and process of science.
 - c. Demonstrate the ability to use scientific methodologies.
 - d. Examine quantitative approaches to study natural phenomena.
2. The laboratory (either a combined lecture and laboratory, or a separate laboratory tied to a science lecture course) content of a GT Pathways science course (GT-SC1)
 - a. Perform hands-on activities with demonstration and simulation components playing a secondary role.
 - b. Engage in inquiry-based activities.
 - c. Demonstrate the ability to use the scientific method.
 - d. Obtain and interpret data, and communicate the results of inquiry.
 - e. Demonstrate proper technique and safe practices.

COMPETENCIES & STUDENT LEARNING OUTCOMES FOR GT-SC1

Inquiry & Analysis:

4. Select or Develop a Design Process
 - a. Select or develop elements of the methodology or theoretical framework to solve problems in a given discipline.
5. Analyze and Interpret Evidence
 - a. Examine evidence to identify patterns, differences, similarities, limitations, and/or implications related to the focus.
 - b. Utilize multiple representations to interpret the data.
6. Draw Conclusions
 - a. State a conclusion based on findings.

Quantitative Literacy:

1. Interpret Information
 - a. Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).
2. Represent Information
 - a. Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).

Course Competencies

1. Recognize, define, and apply the vocabulary, symbolism, and nomenclature of chemistry.
2. Interpret the computed outcome of a chemical calculation to determine its validity.
3. Apply knowledge of chemical principles to real world situations.
4. Analyze and evaluate experimental observations, statements, and data using deductive reasoning and problem solving skills.
5. Use experimental observations and data to formulate predictions, propose trends, and identify patterns of physical or chemical behavior.
6. Synthesize and apply multiple chemical principles to solve complex problems including kinetics, equilibrium, thermodynamics, and solution behavior.
7. Convert descriptive, conceptual, and experimental information into mathematical equations, graphs, diagrams, and tables and use these results to formulate conclusions and discuss implications and limitations.
8. Convert mathematical equations, graphs, diagrams, and tables into descriptive or conceptual explanations, and use these results to formulate conclusions.
9. Demonstrate problem solving ability by selecting or developing the methodology or theoretical framework to solve a variety of chemistry problems.
10. Use the principles of kinetics, equilibrium, thermodynamics, and solution behavior to formulate predictions, propose trends, and identify patterns of physical or chemical behavior.
11. Write and speak clearly and logically in presentations, essays, and/or lab reports about topics related to chemistry.
12. Demonstrate the ability to select and apply appropriate forms of technology to solve problems or compile information in the study of chemistry.
13. Perform hands-on chemistry activities and labs with observations of demonstrations and simulations playing a secondary role.

Topical Outline

- I. Solutions
 - a. Calculations involving measures of concentration: molarity, molality, mass percent and mole fraction
 - b. Calculation using colligative properties: freezing point depression, boiling point elevation, vapor pressure depression and osmotic pressure
 - c. Use of colligative properties to find the molar mass of an unknown
- II. Chemical kinetics
 - a. Reaction rates
 - b. Factors affecting reaction rate
 - c. Rate law: rate equation
 - i. Zero order
 - ii. First order
 - iii. Second order
 - iv. Half-lives
 - d. Reaction rate and temperature
 - i. Arrhenius equation
 - e. Reaction rates and reaction mechanisms
 - f. Deducing reaction mechanisms from rate Laws
 - g. Catalysis
- III. Chemical equilibrium
 - a. Reverse reactions
 - b. Equilibrium constant, K_c
 - c. Equilibrium constant, K_p
 - d. Calculations involving chemical equilibrium in gaseous, aqueous, and heterogeneous phases
 - e. Applications of equilibrium constants
 - f. Le Chatelier's Principle
 - g. Chemical equilibrium and chemical kinetics
- IV. Aqueous equilibria: acids and bases
 - a. Acid-base concepts: Bronsted-Lowry theory and Lewis acid/base theory
 - b. Acid and base strength
 - c. Ionization of water
 - d. pH scale and measurement of pH
 - e. Equilibria in solns of weak acids and bases
 - f. Calculating equilibrium concentrations in solutions of weak acids and bases
 - g. Relationship between K_a and K_b
 - h. Acid/base properties of salts
 - i. Common ion effect and buffer solutions
 - j. pH titration curves
 - i. Strong acid-strong base
 - ii. Weak acid-strong base
 - iii. Weak base-strong acid
- V. Solubility equilibria
 - a. Solubility
 - b. Solubility product constant, K_{sp}
 - c. Calculations involving K_{sp}
 - d. Factors affecting solubility
 - e. Precipitation and separation of ions
- VI. Thermodynamics
 - a. Terminology
 - b. Laws of thermodynamics
 - c. Calculation of entropy changes
 - d. Calculation of free energy changes
 - e. Free energy under standard and non-standard conditions
 - f. Free energy and chemical equilibrium
- VII. Electrochemistry
 - a. Terminology
 - b. Balancing redox reactions using half-reaction method under acidic and basic conditions
 - i. Electrolysis
 - ii. Electrolytic and voltaic cells
 - iii. Cell potentials and electrode potentials
 - iv. Effect of concentration on cell potentials: The Nernst equation
 - v. Standard cell potentials and equilibrium constants
 - vi. Applications of electrochemistry
- VIII. Condensed states (Intermolecular forces)
 - a. Description of the liquid state
 - b. Description of the solid state
 - c. Intermolecular forces
 - d. The phase diagram
 - e. Vapor pressure
 - a. Crystal solids

RECOMMENDED TOPICAL OUTLINE

- I. Nuclear chemistry
 - a. Nuclear reactions and radioactivity
 - b. Types of radioactive decay
 - c. Rate of radioactive decay and half-life
 - d. Nuclear stability
 - e. Energy change in nuclear reactions
 - f. Fission and Fusion
 - g. Detecting and measuring radioactivity
 - h. Biological effects of radiation
 - i. Applications of nuclear radiation
- II. Organic chemistry
 - a. Hydrocarbons: alkanes, alkenes, alkynes, cycloalkanes, cycloalkenes
 - b. IUPAC Nomenclature for the hydrocarbons listed above
 - c. Isomerism: structural, geometric and optical
 - d. Functional groups

Course Policies and Procedures:

Expectations for satisfactory student performance

- Students are expected to be on time and attend all classes and laboratory sessions.
- Students are expected to read related text, and other assigned reading, prior to the class session in which it will be discussed.
- Students are expected to read laboratory exercises and be prepared to begin laboratory procedures upon entering the lab session.
- Students are expected to spend approximately 2 hours, for every hour spent in class, reviewing, reading, answering all chapter questions, and studying. This serves to keep the student up to date with the material and does not include time needed to “cram” for exams.

Attendance

- Excused absences include athletic events, field trips, illness with doctors note (if you are not sick enough to go to the doctor, you are not sick enough to be excused from class), and family emergency (death etc.). To be excused the student must ensure the instructor is notified in writing and in advance.
- Laboratory exercises are essential “hands-on” experiences and cannot be made up. Absence from 3 or more laboratory sessions will result in a grade of **F** in the lab, and will result in failure of the class.

Course content and assessment

- Class will consist of lecture, demonstrations, movies, student presentations, and discussions. Although the text is generally followed, the student is responsible for all material covered in class and any related or assigned reading.

Homework

- Homework assignments will be given for each chapter. The assignments will be handed out in class and posted on the website.
- Homework may be turned in one class day late for full credit. (For example if the assignment is due Mon, then you may turn it in any time up until Tue at 8:00 am for full credit) After that time, the assignment will be worth **ZERO** points, however, on request it will be graded so that you may see if you did the problems correctly.
- Not showing up, oversleeping, excused absences etc. does not negate the due date/time.

Laboratory

- Laboratory sessions will each consist of brief lecture, activities, and review questions. Students are graded on their preparation, performance, and participation.
- Lab assignments are due one lab session after the lab is finished.
- Labs handed in late will receive a 20% late penalty per day.
- Labs turned in after the graded lab is returned are worth **ZERO** points.

Exams

- Exam dates will be determined at least 1 week in advance.
- Missed tests can be made up for full credit only for excused absences and when the instructor is notified in advance and in writing. Missed exams must be made up the first day the student returns to class.
- Without prior arrangements, 25% will be deducted off your test grade per day late.
- Save your tests! There will be a two-part final exam, which will count as two tests. The chapter tests will help you prepare for your final.

Evaluation/Grading Criteria

- One final grade is given for the combined performance in class and laboratory. Your grade will be calculated as either:
 - 60% Exams, 20% Homework, 20% Lab or
 - 80% Exams, 20% Lab
- The grade given will be the better of the two grades determined above.**
- Current Grade can be accessed at <https://cncc.desire2learn.com/> (D2L)
- Grades are based on the standard scale:

Percent Grade

90% A

80% B

70% C

60% D

59% or less F

Calendar/ Schedule:

<u>Chapter</u>	Chapter Name
11	Liquids, Solids, and Intermolecular Forces
12	Solutions
13	Chemical Kinetics
14	Chemical Equilibrium
15	Acids and Bases
16	Aqueous Ionic Equilibrium
17	Free Energy and Thermodynamics
18	Electrochemistry
19	Radioactivity and Nuclear Chemistry
20	Organic Chemistry
21	Biochemistry

Standard College Policies

Attendance Policy

Students should explain the reasons for absence to their instructors. The student is responsible for making up work missed due to any absence, including those involving College-sponsored athletic, academic, or recreational trips. **Students will not be penalized for absences due to College-sponsored activities; however, instructors reserve the right to assign relevant, alternative work for missed class time due to such an activity.** Absences for extenuating circumstances or activities outside of a College-sponsored activity may be excused by the Dean of Instruction or the Vice-President of Instruction and Student Affairs with notification to the faculty.

It is ultimately the student's responsibility to officially drop or withdraw from a course through the Admissions and Records Office. Failure to do so may impact a student's grade, official transcript, and College financial account.

Academic Integrity Policy

Colorado Northwestern Community College considers academic dishonesty, which includes cheating and plagiarism, to be an extremely serious offense, and will be dealt with by appropriate disciplinary action up to and including suspension. The word "cheating" refers to the acts of giving, utilizing, or receiving un-permitted aid during examinations or in the preparation of reports or any other class work that the

instructor will use as a basis for evaluation. The word “plagiarism” refers to the use of another person’s work without giving proper credit to that person. When paraphrasing another person’s work (i.e., borrowing but rewording that person’s facts, opinions, or ideas), a student must give proper credit through the use of appropriate documentation. When copying verbatim another person’s work (i.e., words, phrases, sentences, or entire passages), a student must credit that person through the use of quotation marks and appropriate documentation.

Anti-Discrimination Policy

Colorado Northwestern Community College prohibits all forms of discrimination and harassment including those that violate federal and state law, or the State Board for Community Colleges and Occupational Education Board Policies 3-120 and 4-120. The College does not discriminate on the basis of sex/gender, race, color, age, creed, national or ethnic origin, physical or mental disability, veteran status, pregnancy status, religion, genetic information, gender identity, or sexual orientation in its employment practices or educational programs and activities. Colorado Northwestern Community College will take appropriate steps to ensure that the lack of English language skills will not be a barrier to admission and participation in vocational education programs.

Americans with Disabilities Act

Any student, who believes he/she has a disability, as outlined in the Americans with Disabilities Act, and would like reasonable accommodations, should set up an appointment to discuss this with the ADA Coordinator on his/her respective campus. Faculty is not allowed to provide accommodations without proper notification from the ADA Coordinator.

Early Alert

All instructors participate in CNCC’s Early Alert system. Every three weeks, your grades will be submitted to members of the Student Success Team. In addition, your instructor may speak to you directly about his/her concerns regarding a number of possible issues, including absence, late or missing submissions, poor or high performance on assessments, etc. The electronic Early Alert system is designed to supplement this communication and allow instructors to request additional early intervention for students from a CNCC advisor or specialist. The hope is to provide you the support you need to be successful and to share information about additional learning opportunities the college offers. Alerts can be sent throughout the semester, can be in response to positive or negative performance, and are designed to link you with support opportunities here at CNCC, such as tutoring services, honors programs, financial aid resources, etc. If you are contacted by a CNCC advisor, please speak with him/her and your instructor to find out more about the nature of the alert and the supports and services your instructor has recommended.

Statement Regarding Mandatory Reporting

Our College is committed to preserving a safe and welcoming educational environment for all students. As part of this effort, I have an obligation to report certain issues relating to the health and safety of campus community members. I must report to the appropriate College officials any allegation of discrimination or harassment. Sexual misconduct, which includes sexual harassment, non-consensual sexual contact, non-consensual sexual intercourse, and sexual exploitation, is considered a form of discrimination. In addition to reporting all discrimination and harassment claims, I must report all

allegations of dating violence or domestic violence, child abuse or neglect, and/or credible threats of harm to yourself or others. Such reports may trigger contact from a College official who will want to talk with you about the incident that you have shared. In almost all cases, it will be your decision whether you wish to speak with that individual.

If you would like more information, you may reach the Title IX Coordinator: 970-824-1102 or the EO Coordinator at 970-675-3335.

Reports to law enforcement can be made at 970-675-8467 in Rangely or 970-824-1111 in Craig.

If you would like a confidential resource, in Rangely, please contact Counseling and Advocacy at 970-629-5729 or 670-629-0709. In Craig contact Advocates Crisis Support Services at 970-824-9709 or 970-827-2400.

Further information may be found on the College web site: [Sexual misconduct title ix](#).