
Calumet College



of Saint Joseph

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Calumet College of St. Joseph is a Catholic institution of higher learning dedicated to the academic, spiritual and ethical development of undergraduate and graduate students. Informed by the values of its founding religious community, the Missionaries of the Precious Blood (C.P.P.S.), the College promotes the inherent dignity of all people, social justice, an ethic of service, student empowerment, opportunity, and lifelong learning.

COURSE SYLLABUS, Spring 2019**Course: CHEM 205 GENERAL & ANALYTICAL CHEMISTRY II – SECTION A****Instructor Information:**

Instructor Name	Dr. Ahmed Lakhani
Office Number:	Room 512
Phone Number:	219-4734275
Email:	alakhani@ccsj.edu
Office Hours:	Monday & Wednesday: 1:30 – 3:30 pm
Instructor Background:	B.S. in Biochemistry from University of Illinois at Urbana-Champaign. Ph.D. in Chemistry (focus in Physical Chemistry) from University of Illinois at Chicago. Research interest: Structures Elucidation of Biomolecule via Optical Spectroscopy (IR, UV-Vis, VCD, ECD, etc.)

Course Information:

Course Time:	TR: 8:30 to 10:00 am
Classroom:	Room 332
Prerequisites:	Placement into MATH 104 C and higher grade in CHEM 200 lecture
Required Books and Materials:	Required daily: 1) You will need any current copy of the periodic table to bring with you to class daily 2) You will need a scientific calculator. The calculator on your phone does not count. The calculator does not to be expensive. For example, a Texas Instrument TI-30X II will suffice (\$10) Book: Chemistry a molecular approach: By Niva Tro 4 th edition, Pearson
Learning Outcomes/ Competencies:	Students in this course will: <ul style="list-style-type: none">• Apply significant figures rules in all calculation providing the correct number of significant

figures and units

- Convert between different units using conversion factors and dimensional analysis
- Name elements, provide their symbols and determine the number of proton, neutrons, electrons
- Name salts, acids, base and covalent compounds and provide formulas for these given a molecular formula
- Provide brief description of the accomplishment of Planck, Einstein, Thompson, Rutherford, Bohr, and Schrodinger; and how these contributed to understanding the atom
- Convert between wavelength, energy and frequency for light and understand the relationship between absorbed light and color
- Determine whether a bond is metallic, ionic, covalent or polar covalent
- Evaluate the molecular geometry, hybridization and polarity of a covalent molecule
- Evaluate the type of molecular bonding (s or p) in a covalent molecule and identify
- Describe equilibrium in terms of Le Chatelier's principle
- Write equilibrium constant expressions
- Calculate equilibrium constants
- Perform pH calculators
- Show the mathematical relationship between K_a and K
- List the 2nd and 3rd laws of Thermodynamics
- Compare entropy and enthalpy
- Solve problems using the Gibbs Free Energy relationships

This course meets the following learning objectives for the Biomedical Science program:

- Scientific Knowledge and Critical Thinking:
 - Students will demonstrate substantial and up to date core knowledge of broad areas in basic biomedical science
 - Students will demonstrate the ability to accurately and critically evaluate their own scientific work and work of others.
- Research Skills and Problem Solving Ability:
 - Students will demonstrate advanced understanding of a range of technical and conceptual approaches used in biomedical research.
 - Students can design, carry out, and interpret research projects that generate new knowledge that advances the biomedical science and human health.
- Specific Expertise:
 - Students can articulate the significance of their own work to their chosen research area in both historical and forward-looking contexts.
 - Students will demonstrate mastery of a range of technical and conceptual approaches used in their selected research area.
- Communication:
 - Students will demonstrate the oral, written and media communication skills required to be effective communicants, teachers and mentors of peers, future scientist and scientifically literate citizens.
- Ethics and Advocacy:
 - Students will apply highest standards of ethics to their research (data managements,

research subjects, stewardship of research funds)

- Students will improve their confidence and interactions with colleagues and the public.
- Students will be able to advocate for the role of science in medicine and society.

The course also meets the following General Education Program objectives:

- Students will, at an introductory level, read analytically, synthetically, and critically in a variety of genres
- Students will, at an introductory level, write in a variety of forms using valid logic, persuasive rhetoric, and correct grammar, usage, and punctuation.
- Students can, at an introductory level, represent, apply, analyze, and evaluate relevant qualitative and quantitative mathematical and scientific evidence (i.e. equations, graphs, diagrams, tables, words) to support or refute an argument.
- The student will, at an introductory level, be able to apply ethical standards to social issues and analyze their own core beliefs and the origin of these beliefs.

This course meets Calumet College of St. Joseph's Signature Assignment requirement to demonstrate fundamental competency in quantitative reasoning and scientific inquiry.

Course Description: A 3-credit hour course implementing the general and analytical topics including Chemical Quantities, stoichiometry, periodicity, reaction types, the gaseous state, Quantum machines, and types of chemical bonding.

Learning Strategies: Active learning, Blackboard, group discussions, team projects, collaborative learning, interactive lecturing, laboratory exercises, demonstration.

Experiential Learning Opportunities: In class discussion, comprehension and critical thinking along with laboratory experience is essential for a fundamental understanding of the scientific methods. This course has required laboratory portion that provides students with experiential learning through experimental design, hypothesis development, data interpretation, and communication of results through laboratory reports. Alongside the weekly lab reports, the students will prepare a final poster at the end of the semester to be presented and submitted to a local conference.

Assessments:

Major Assignments:	Completed at the end of each chapter (HW). Approximately 15.	25%
Assessments:	Quizzes: Given at the beginning of class; covers the assigned reading/previous lecture Lecture Exam: Four 90 minutes' exam will be administered during class (total of 4)	10% (Each 15%) Total: 60%
Class Participation:	Class attendance and participation	5%
Total	Total Percent	100%
Grading Scale:		
100% – 92%: A	91% – 90%: A-	
89% – 88%: B+	87% – 82%: B	81% – 80%: B-
79% – 78%: C+	77% – 72%: C	71% – 70%: C-
69% – 68%: D+	67% – 62%: D	61% – 60%: D-
59% and below:	F	

Course Schedule:

CHEM 205 Lecture			
Class Date	Lecture/Class Discussion/Activities	HW	Quiz
Jan 15 - 17	Introduction, Course Overview Chapter 7 The Quantum-Mechanical Model	Ch. 7	Ch. 7
Jan 22 - 31	Chapter 8 Periodic Properties of the Elements	Ch. 8	Ch. 8
Jan. 31	EXAM 1		
Feb. 5 - Feb. 21	Chapter 9 Chemical Bonding I: The Lewis Model Chapter 10 The Chemical Bonding II: MO	Ch. 9 Ch. 10	Ch. 9 Ch. 10
Feb. 21	EXAM 2		
Feb. 26 - 28 Mar. 3 - 9 Mar. 12- 19	Chapter 5 Gases No Classes Spring Break Chapter 13 Solutions	Ch. 5 Ch. 13	Ch. 5 Ch. 13
Mar. 21	EXAM 3		
Mar. 26 - Apr. 11	Chapter 6 Thermochemistry Chapter 18 Free Energy and Thermodynamics	Ch. 6 Ch. 18	Ch. 6 Ch. 18
Apr. 16	EXAM 4		
Apr. 18 - May 1	April 18: Lectures/HW will be posted online Chapter 14 Chemical Kinetics Chapter 15 Chemical Equilibrium	Ch. 14 Ch. 15	Ch. 14 Ch. 15
2-May	Final EXAM		
I reserve the right to change this schedule to meet the needs of the class			

Responsibilities	
Attending Class	<p>You cannot succeed in this class if you do not attend. We believe that intellectual growth and success in higher education occur through interaction in the classroom and laboratories. Being absent doesn't excuse you from doing class work; you have more responsibilities to keep up and meet the objectives of this course.</p> <p>Note: Attendance is counted as being present from the first 10 minutes of class until the end of lecture and lab. It is the students' responsibility to make attendance a priority. Anyone missing after the first 10 minutes of class will be marked absent unless a written excuse is provided within 24 hours of the occurrence. Similarly, anyone leaving early without a written excuse and/or informing the instructor prior to leaving will be counted as absent.</p> <p>Train delay, broken down cars, oversleeping, forgetting, and other personal business are example of invalid excuses. Additionally, you should plan to arrive on time and remain throughout the lecture to avoid disrupting the class. Other classroom disruptions, such as cell phone, papers, etc. are unacceptable; there device should be turned off before the start of class</p> <p>Note: it is to your benefit to attend each class meeting. You are responsible for the material presented in class and all in-class announcements and assignments. Attendance is mandatory, however, for all examinations since they cannot be made up at a later date will not be excused without a valid excuse. The validation of the excuse is left to the discretion of the instructor of the course whether or to accept that excuse.</p>
Turning In Your Work	<p>You cannot succeed in this class if you do not turn in all your work when due.</p> <p>Assignments will not be accepted after their due dates. You may request an extension in writing at least 24 hours in advance of the due date for assignments, but it is up to the instructor's discretion whether or not to allow an extension.</p>
CCSJ Student Honor Code	<p>This course asks students to reaffirm the CCSJ Student Honor Code:</p> <p>I, as a student member of the Calumet College academic community, in accordance with the college's mission and in a spirit of mutual respect, pledge to:</p> <ul style="list-style-type: none"> • Continuously embrace honesty and curiosity in the pursuit of my educational goals; • Avoid all behaviors that could impede or distract from the academic progress of myself or other members of my community; • Do my own work with integrity at all times, in accordance with syllabi, and without giving or receiving inappropriate aid; • Do my utmost to act with commitment, inside and outside of class, to the goals and mission of Calumet College of St. Joseph.
Using Electronic Devices	<p>Electronic devices can only be used in class for course-related purposes. If you text or access the Internet for other purposes, you may be asked to leave, in which case you will be marked absent.</p> <p>No social media chatting/texting will be allowed to be used during lecture or</p>

	<p>lab times unless otherwise directed by the instructor. No videotaping or recording of lecture without discretion of the instructor. The instructor reserves the right to ask you to leave the room if you interrupt the class.</p> <p>The science faculty will address electronic device uses as follows:</p> <p>Occurrence</p> <p>1st – Students is given a verbal warning 2nd – Students is instructed to leave the classroom The student cannot return to class until they have met with the professor.</p> <p>3rd – Student is instructed to leave the classroom The student cannot return to class until they have met with V.P. of Academic Affairs.</p>
Participating in Class	You must be on time, stay for the whole class and speak up in a way that shows you have done the assigned reading. If you are not prepared for class, you may be asked to leave, in which case you will be marked absent.
Doing Your Own Work	<p>If you turn in work that is not your own, you will be subject to judicial review by the Faculty-Student Grievance Committee. These procedures can be found in the Student Planner. The maximum penalty for any form of academic dishonesty is dismissal from the College.</p> <p>Using standard citation guidelines to document sources avoids plagiarism. You'll find guides to the major citation methods at the CCSJ Specker Library Web page at http://www.ccsj.edu/library/subjectsplus/subjects/guide.php?subject=cite</p> <p>PLEASE NOTE: All papers may be electronically checked for plagiarism.</p>
Sharing Your Class Experience	At the end of the term, you will have the opportunity to evaluate your classroom experience. These confidential surveys are essential to our ongoing efforts to ensure that you have a great experience that leaves you well prepared for your future. Take the time to complete your course evaluations – we value your feedback!
Withdrawing from Class	After the last day established for class changes has passed (see the College calendar in the CCSJ Course Catalog), you may withdraw from a course by following the policy outlined in the Course Catalog.

Resources	
CCSJ Book Rental Program	<p>The CCSJ Book Program ensures that everyone has the right course materials on the first day of class to be successful. You pay a book rental fee each semester, and in return, receive all the materials for all your classes prior to the beginning of classes. At the end of the semester, simply return the books. For traditional students, the Book Rental Program is conveniently located in the library, where students can pick up and return their books. For students in accelerated programs and graduate programs, books will be delivered to their homes and they can return them by mail. For more information, see http://www.ccsj.edu/bookstore. All books must be returned at the end of the semester or you will incur additional fees, which will be charged to your student account.</p>
Student Success	The Student Success Center provides faculty tutors at all levels to help you

Center:	master specific subjects and develop effective learning skills. It is open to all students at no charge. You can contact the Student Success Center at 219 473-4287 or stop by the Library.
Disability Services:	Disability Services strives to meet the needs of all students by providing academic services in accordance with Americans with Disabilities Act (ADA) guidelines. If you believe that you need a “reasonable accommodation” because of a disability, contact the Disability Services Coordinator at 219-473-4349.
Student Assistance Program	Through a partnership with Crown Counseling , Calumet College of St. Joseph provides a free Student Assistance Program (SAP) to current students. The SAP is a confidential counseling service provided to students for personal and school concerns which may be interfering with academic performance and/or quality of life. The SAP counselor is available on campus once a week and off-site at the Crown Counseling offices in Crown Point or Hammond. For more information, contact Kerry Knowles SAP Counselor , at 219-663-6353 (office), 219-413-3702 (cell), or kerryk@crowncounseling.org .
CCSJ Alerts:	Calumet College of St. Joseph’s emergency communications system will tell you about emergencies, weather-related closings, or other incidents via text, email, or voice messages. Please sign up for this important service annually on the College’s website at: http://www.ccsj.edu/alerts/index.html .