

ADVANCED CHEMISTRY 2 (CCP CHEM 1515) SYLLABUS

General Chemistry I CHEM 1515 CRN Lecture (4 sem hours)

General Chemistry I Lab 1515L CRN Lab (0 sem hour)

Instructor: Tom Slaven, Canfield High School; email: tslaven@canfieldschools.net

Course Website: Google Classroom/Blackboard trslaven@ysu.edu

Course Goals: To acquire and demonstrate the understanding of chemistry and the fundamental concepts of matter and its changes; to become familiar with the language of chemistry"; to learn to apply our knowledge of these concepts to solving chemical problems, both algorithmic and conceptual. This course will be taught in close collaboration between YSU and area high schools. It is intended to be an advanced experience in General Chemistry taught at the college level by a team of instructors that includes YSU faculty and experienced high school chemistry teachers who are a part of YSU's chemistry & science education program.

General Course Description:

An introduction to the fundamental principles of chemistry, including measurement and calculation; chemical stoichiometry; the properties of gases; atomic and molecular structure; bonding; thermochemistry; and periodic properties.

Course Prerequisites: Chemistry 1 with a grade of A or B and teacher recommendation.

Course Goals: An introduction to the fundamental principles of chemistry, including measurement and calculation; chemical stoichiometry; the properties of gases; atomic and molecular structure; bonding; thermochemistry; and periodic properties. Intended for majors in the natural sciences and engineering.

Learning Outcomes: Upon completion of this course, students should be able to:

1. Write and interpret chemical formulas and equations.
2. Calculate stoichiometric values.
3. Utilize the periodic table to make predictions.
4. Describe the properties of gases.
5. Use thermochemical relationships to describe energy changes in a system.
6. Compare and contrast major types of chemical bonding and the behavior of substances having different bond types.
7. Predict molecular geometry of various molecules.

Textbook: Chemistry by Julia Burdge, Second Edition, 2010.

Supplies: An electronic calculator with functions for exponential notation, roots, logarithms

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Credit:

Students participating in this program at Canfield High School under the College Credit Plus Program may enroll as YSU students and receive a final grade from both Canfield High School and YSU using the grading system described below. All students taking the course for college credit must take the YSU final exam.

Grading:

Each nine weeks grade will be determined by the unit exams, quizzes, homework, and laboratory grades-

Exams 65%

Assignments 15%

Lab 20%

Grading Scale: 90 - 100% = A, 80 - 89% = B; 70 - 79% = C; 60 - 69% = D; 0% - 59% = F

The grade of A represents exceptional work in which the student shows that he or she has firmly grasped and achieved the objectives of the course. • The grade of B indicates very good work and considerable grasp of the essentials of the course. • The grade of C indicates good work and a usable grasp of the essentials of the course. • The grade of D indicates a definite, but not necessarily coherent, knowledge of the course. • The grade of F indicates that the student has not achieved even a minimum grasp of the essentials of the course. This grade can also result from failure to withdraw officially from a course

Worksheets, suggested problems from the text, and video questions will be assigned throughout the course. Working problems is the key to your success in this course. When an assignment is collected one or more questions from the assignment will be graded for correctness, not completion. These graded problems will determine your assignment grade. It would also be wise to work through all the sample, practice, and checkpoint problems in the textbook

You are responsible for any announcements concerning course procedures which are made in class. (If you are absent, you are expected to get notes, announcements, etc. from another student in the class.)

For YSU students only: An incomplete grade of I may be given to a student who has been doing satisfactory work in a course but, for reasons beyond the control of the student and deemed justifiable by the instructor, had not completed all requirements for a course when grades were submitted.

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A letter grade may not be changed to an I (Incomplete) after the term has ended and grades have been recorded. A written explanation of the reason for the I (Incomplete) must be forwarded by the instructor to the Office of Records. This explanation will be included in the student's permanent record, with copies to the student and department chairperson.

For fall term courses, the final date to complete an I will be of the within the first 2 weeks of the following term; for the spring term courses. With approval by the instructor and the dean of the college in which the course is taught, the completion date may be extended. Courses not completed by the appropriate date will be converted to an F.” (See the [Undergraduate Bulletin](#))

Safety: The potential risk is present in some lecture demonstrations and laboratory experiments. Accidents have been rare, but have happened. Faculty and staff members exercise great care to minimize and, where possible, eliminate all potential hazards. Additionally, minimization of risks require that students come well prepared for each assigned exercise and are attentive in class. Safety glasses must be worn in the laboratory at all times. If you have a condition (e.g. chemical sensitivity, pregnancy) that might affect your laboratory safety, discuss it with your physician and instructor and alternative arrangements for the lab can be made. Contact the instructor immediately if you have any questions on this or any other safety issues

Expectations/Responsibilities

1. Please be on time and prepared to work!!
2. **Masks must be worn at all times unless directed by the instructor.**
3. **All surfaces must be disinfected before you leave the classroom.**
4. Be courteous of others – we are all in this together and will learn from each other.
5. Always ask questions if you do not understand something or need clarification. There is a direct relationship between participation and learning.
6. Extra help is available. Just see me to schedule.
7. If you are having a problem, communicate with me to see if we can find help before the issue becomes larger.
8. Regular attendance is imperative. It is your responsibility to get assignments and make up work. Solutions to the previous night's work will be posted on Google Classroom with assignments. Assignments not made up according to school policy will result in a zero.
9. If necessary email me at tslaven@canfieldschools.net or message through Google Classroom
10. Breaking of classroom rules/guidelines may result in point deductions from your grade as well as disciplinary action.

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University Policies:

Academic Honesty: In accordance with university policy and professional standards, the highest levels of academic integrity are expected in this lecture and lab. The code of student conduct will be strictly enforced. Academic dishonesty will result in reductions of grades and/or expulsion from this class and/or the university.

Statement of Non-Discrimination: Youngstown State University does not discriminate on the basis of race, color, national origin, sex, sexual orientation, gender identity and/or expression, disability, age, religion or veteran/military status in its programs or activities. Please visit www.yсу.edu/ada-accessibility for contact information for persons designated to handle questions about this policy.”

Students With Disabilities: In accordance with University procedures, if you have a documented disability and require accommodations to obtain equal access in this course; please contact me privately to discuss your specific needs. You must be registered with the Center for Student Progress Disability Services, located at 2082 Kilcawley, and provide a letter of accommodation to coordinate reasonable accommodations. You can reach CSP Disability Services at 330-941-1372.

Academic Integrity: As outlined in The Student Code of Conduct, all forms of academic dishonesty are prohibited at Youngstown State. This includes plagiarism, the unauthorized use of tools or notes in taking tests or completing assignments, fabrication of data or information used for an assignment, working with others without permission from the instructor, and more. A student who is believed to have violated the academic integrity policy will meet with the instructor to discuss the allegations. The student may accept responsibility for the violation and any sanctions selected by the instructor, or they have the right to ask for a hearing before a hearing panel. The full Academic Integrity policy can be found in Article V of The Student Code of Conduct, while further information on University procedures for alleged academic integrity violations can be found in Article V.

Center for Student Progress: YSU is committed to your academic success. As a student, you have access to these learning support programs at no charge: What: Academic Coaching, Supplemental Instruction, and Tutoring in a variety of courses When: By appointment. Monday thru Thursday 8:00 am – 6:00 pm, and Friday 8:00 am – 4:00 pm Where: Kilcawley Center West (near Dunkin Donut entrance) Email: blvarian@ysu.edu

Math Assistance Center: What: Drop-in group tutoring, homework assistance, computers, reviews and formula sheets When: Monday thru Thursday 9:00 am – 6:00 pm, and Friday 9:00 am – 3:00 pm Where: Lincoln Building, room 408 Email: mathassist@ysu.edu

Writing Center: What: Writing consultations for any discipline, Linguistics tutoring, Basic computer literacy When: Monday thru Thursday 9:00 am – 5:00 pm, Friday 10:00 am – 1:00 pm, and Sunday 4:00 – 7:00 pm (appointments or walk-ins) Where: Maag Library, Lower Level, room 171 Email: wcenter@ysu.edu

The Penguin Service Center: A One Stop for Campus is an enrollment resource established to help students access and manage their academic record and student accounts. Please visit the Penguin Service Center or call (330) 941-6000 for assistance with financial aid, records access, registration processes, and tuition charges/billing. The office is located on the second floor of Meshel Hall.
College/ University Career Advisement <https://ysu.edu/academic-advising>

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University Counseling Services Location: Kilcawley Center - Room 2082 Hours: Monday through Friday - 8:00 A.
Location: Kilcawley Center - Room 2082 Phone: (330) 941-3737

Transfer Assurance Guidelines - Natural Sciences (Revised, Endorsed, and Implemented April 25, 2017)

Learning Outcomes:

The course directly emphasizes at least one of the learning outcomes for the Transfer Module. Which of these learning outcomes are addressed and how?

- a. Communicate effectively: All general education programs include a component for writing; many also include a component for oral communication or presentation
- b. Evaluate arguments in a logical fashion: Competence in analysis and logical argument are explicit learning goals for most general education programs, although these skills go by a variety of names (e.g., critical thinking, analysis, logical thinking, etc.)
- c. Employ the methods of inquiry characteristic of natural sciences, social sciences, and the arts and humanities: The tools for solving problems vary across disciplines; general education introduces students to methods of inquiry in several fields of study and thereby prepares students to integrate information from different disciplines.
- d. Acquire an understanding of our global and diverse culture and society
- e. Engage in our democratic society: One of the overarching goals of general education is to prepare students to be active and informed citizens, the development of a disposition to participate in and contribute to our democracy is full of equal importance to the goal of having the skills to do so intelligently.

Guideline 1: The course has the required entry level college proficiencies appropriate to the course. Entry level college proficiencies can be shown using a variety of means including placement exams, prerequisite coursework and a description of the course materials.

Guideline 2: Course is not remedial or developmental.

Guideline 3: Course does not cover variable content from term to term.

Guideline 4: Course is not a special topics course.

Guideline 5: Course is not an upper division course.

Guideline 6: Course is not a narrowly focused technical or pre-technical course.

Guideline 7: Course is an introductory course that makes clear the importance of experimental inquiry in the sciences and the way in which such inquiry into the natural world leads scientists to formulate principles that provide universal explanations of diverse phenomena.

Guideline 8: Course helps the students to develop an understanding of structured thinking involving induction and deduction.

Guideline 9: Course is from natural science disciplines such as astronomy, biology, chemistry, environmental science, geology, physical geography or physics.

Guideline 10: The course has as a goal the development of an understanding of how scientific principles are built and used in the modern world and of the impact of science on society.

Guideline 11: The course does not focus exclusively on content coverage, without addressing the learning outcomes for the Transfer Module.

Guideline 12: Course has a laboratory component that has at least one credit hour and at least 1,500 minutes of laboratory activities (an average of no less than two hours per week for a traditional fifteen- week semester).

Guideline 13¹: The laboratory component of the course achieves the following learning objectives in the equivalent of at least 10 weeks (~2/3) of the course's "laboratory activities": a. involves realistic measurements of physical

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quantities; b. involves data analysis, using data that are unique and/or physically authentic and that includes random and/or systematic (natural) variability; c. includes realistic interactions with experimental apparatus, and realistic manipulation of tools/ instruments and/or observed objects in space and time; d. involves synchronous feedback on safety (and consequences of unsafe actions), correctness of procedure, and progress toward experimental goals; and e. involves effective interaction with the instructor at several points during each lab activity.

Footnotes for

Guideline 13¹:

a. Some disciplines, such as astronomy, meteorology, and ecology, are more amenable to achieving a quality virtual educational laboratory experience. By contrast, other disciplines, such as chemistry*, microbiology, and physics, are much less likely to meet the expectations of an OTM natural sciences laboratory course if focused heavily on virtual laboratory experiences. [*The American Chemical Society has released a Position Statement on this issue:

<https://www.acs.org/content/acs/en/policy/publicpolicies/education/computersimulations.html>

b. Synchronous feedback on safety could be achieved using sophisticated computational approaches or by actual instructor feedback

Topics Covered:

Unit 1	Intro: Matter (Classification/Properties); Measurement Significant Figs.; Dimensional Analysis; Problem Solving
2	Problem Solving; Subatomic Particles, Atomic Structure Periodic Table, Molecular/Ionic Compounds (Nature of Molecular/Ionic Compounds (Nomenclature)
3	FW; %Composition; Balancing Equations Molar Mass; Stoichiometry Stoichiometry; Limiting Reactants; %Yield Molarity; Chemical Analysis
4	Electrolytes; Precipitation Reactions; Acid-Bases Reactions ;Oxidation-Reduction Reactions
5	Gases(Properties/Laws) Gases(Ideal Gas Law, Density, Partial Pressure) Gases(KMT, Effusion/Diffusion; Real)
6	Thermochemistry (Intro) Thermochemistry (Enthalpy, Calorimetry) Thermochemistry (Hess' Law; H_f) Exam Review
7	Atomic Structure (Nature of Light; Quantum; Spec Lines) Atomic Structure (Quantum #'s; Orbitals; Electron Config.) Periodic Table (History, Properties, Trends) Periodic Table (Properties, Trends, cont.)
8	Chemical Bonding (Types, Electroneg/Polarity) Chemical Bonding (Octet Rule, Lewis Structures, Resonance) Molecular Geometry (Electron Domain/Molecular; Polarity)
9	Molecular Geometry (VSPER, Hybridization) Molecular Orbital Theory; Chap 9 Review