

CHE202 – General Chemistry II
The College of New Jersey
Syllabus/Course Policy

Instructor:
Lab Instructor:

Lecture Time:

Laboratory: Dates/Times
(no make-ups for missed labs; missing 2 labs results in failing the course)
12 points each

The deep learning outcomes associated with TCNJ's 4th hour are accomplished by the activities conducted in the scheduled laboratory section of this course.

Text: Chemistry, 4th Edition, Julia Burdge, McGraw-Hill, 2017. **IF in a PRIOR SEMESTER, you purchased a registration code for CHE201 and CHE202 use of CONNECT, DO NOT purchase another code. (If in the past you registered for THIS Burdge book, that Connect registration lasts for both CHE201 and CHE202).**

Web Site: CONNECT is the McGraw-Hill Web-based interactive assignment and assessment platform which you will access and use with a registration code purchased from the TCNJ bookstore or online. When you register in Connect, ChemDraw will be automatically downloaded on your computer. Connect is book-specific so any Connect code you may have from a previous edition of this Burdge book or from any other McGraw Hill textbook such as Chang, will NOT work for this course. You must access our class section of CONNECT by going to <http://connect.mheducation.com/class/m-brescia-f-tuesday-friday-930-am> This is a unique address for our class section. At this site, you will find additional information on how to register with a previously purchased access code from last semester or how to buy access online. It is best if you enroll in our section of CONNECT before the semester begins. Your work performed on this web site is part of your grade.

Laboratory Notebook: CHE202 Custom Lab Notebook, 2017. Published by TCNJ ITS and sold in the TCNJ Bookstore. Additionally, experiments will be available as handouts in Canvas.

Office Hours: Science Complex Chemistry Building Dates/Times

Homework: Assigned at each lecture, due the following lecture and graded in Connect.

Quizzes: Given 9-10 times throughout the semester in class or in Connect.
10 points each with their total constituting 8% of course grade
(no make-ups for missed quizzes.)

Exams: Dates TBA and a Final **ACS Exam** TBA in PAWS
All exams will be closed book and closed notes.
Do NOT make travel plans until the Final exam date is posted.

E-Mail: This is the primary communication tool for this course. You must check it daily.

Academic Integrity

It is expected that students perform with a high level of responsibility and academic honesty. Cheating, plagiarism, and unauthorized collaboration are considered academically dishonest and will result in a failure of this course. Such dishonesty would include, but is not limited to: submitting as his/her own lab report sections, calculations, analysis etc copied or partially copied from the handout or any other printed source, another student or the web. Credit must be given for words quoted. TCNJ's academic integrity policy is available at: <http://policies.tcnj.edu/policies/digest.php?docId=9394>

Below is a tentative schedule of topics and laboratory experiments for the semester. Sections in the chapters to be considered as well as any other changes in the schedule will be announced in class.

<u>Week Starting</u>	<u>Tuesday</u>	<u>Friday</u>	<u>Lab</u>
1	11.1-11.2	11.3-11.5	NO LABS THIS WEEK
2	11.6-11.7	13.1-13.4	Safety, Lab Check-in, Vapor Pressure of Water
3	13.5-13.7	Exam 1	Colligative Properties
4	14.1-14.2	14.3-14.4	Determination of Iron
5	14.5-14.6	15.1-15.3	Kinetics (Part A & B)
6	15.4-15.5	16.1-16.6	Kinetics (Part C & D)
7	16.7-16.12	Exam 2	Neutralization of an Antacid
8	Mid-semester break		NO LABS THIS WEEK
9	17.1-17.2	17.3	Ka of a Weak Acid
10	17.4-17.6	18.1-18.3	Titration of Polyprotic Acid
11	18.4-18.7	Exam 3	Group A Cations
12	19.1-19.2	19.3-19.5	Ksp and Common Ion Effect
13	19.6-19.8	20.1-20.4	Redox Titration
14	20.5-20.8	Catch up	Electrolysis of Water
Final	Exam 4	Review	Lab Check-out

Final Examination is the standardized ACS exam and its date/time will be posted in PAWS.

The college Final Examination Policy can be found at:
<http://policies.tcnj.edu/policies/digest.php?docId=9136>

Student Assessment

Laboratory reports will be graded on a weekly basis and results will be posted in Canvas to allow students to view their past and current results at any time. The syllabus provides a schedule for full-period comprehensive examinations given in class as well as lecture and lab experiment sequence. Below is the written course grading policy with the exact weighting of how the examinations, laboratory, and quizzes will count toward your final grade.

Evaluation: The final composite score for the semester course will be determined according to the following percentages:

Exams #1-4	13% each or 52% of course grade
Final exam	20% of course grade
Quizzes	8% of course grade
Labs & reports	<u>20%</u> of course grade
Total	100%

The final letter grade will be assigned according to the following composite percentage:

A- , A,	89 – 91 %	92 – 100%	
B- , B, B+	79 - 80 %	81 – 85%	86 – 88%
C- , C, C+	69 - 70%	71 – 75%	76 – 78%
D, D+		60 - 65%	66 - 68%
F	60% and below		

Statistical adjustments may be made at the end of the semester to normalize or maintain similar averages across the sections.

Attendance:

It is expected that students will attend all scheduled lectures and labs and complete all assignments on time. There will be **no make-up** exams, quizzes, labs or “extra-credit” assignments. **If you miss more than 1 laboratory experiment, you will fail the course.** Missed unexcused quizzes will count as zero. Missed quizzes due to an excused absence will be dropped. Exams missed because of an **excused absence** will be given the same score as obtained on the final exam in calculating the composite final percentage for assignment of letter grade. Students missing the final exam because of an **excused absence** will receive an incomplete grade, which must be made up within the time allowed by college policy. **If the final exam is missed and unexcused, you fail the course. An absence will be rendered excused by valid written documentation.** While attendance itself is not used as a criterion for academic evaluations, class and lab attendance are essential. TCNJ’s attendance policy is available at:

<http://policies.tcnj.edu/policies/digest.php?docId=9134>

Problem Solving Working problems is the best way to learn and perform well in chemistry courses. Chemistry cannot be mastered without problem solving skills learned through extensive work solving chemistry problems.

Dress code in Lab: No open-toed shoes of any kind are permitted.

Long hair must be tied back away from your face.

Shorts and sleeveless tops are not permitted.

Safety goggles must be worn at all times in the laboratory.

Laboratory Check-In: Attendance is mandatory. Equipment will be checked-in and lab workstation and partner will be assigned. **Laboratory safety will be reviewed.** Your final course grade will be dropped one letter grade if you are absent and unexcused for this lab period. All College safety policies as described in the TCNJ Undergraduate Student Safety Handbook, the ACS Safety Manual for Students and the Chemistry Department handouts must be followed at all times. These documents are posted in your Canvas Files. If you have any questions about the chemicals and/or equipment you are being asked to use, ask your instructor. You must document that you have read the safety materials posted in Canvas by signing a statement to that effect in the first lab period. You must also take a Safety Quiz in Qualtrics online, print and hand in your documented score on this quiz prior to being allowed to perform a wet lab in this course.

Laboratory Check-Out: Attendance is mandatory. Equipment will be checked out and the laboratory cleaned. Your final course grade will be dropped one letter grade if you are absent and unexcused for this lab period.

Textbook and Laboratory Notebook: Students must use the current text and laboratory notebook. There are no exceptions. If you have any questions or concerns about your textbook and lab notebook, please bring them to the instructor's attention immediately.

Pre-lab Assignment:

It is absolutely essential that each student come to lab fully prepared with a thorough understanding of the experiment background, the procedure, the reactants/products, how data will be collected, and any safety concerns. The following must be completed **before** lab:

- Read any additional reading required for the experiment.
- Read the experiment introduction as well as the procedure in the handout posted in Canvas.
- Complete the pre-lab Notebook pages (see Canvas for a detailed description for completing these pages).
- Complete the pre-lab questions in the Handout.

These completed *pre-lab notebook pages* and *pre-lab handout questions* must be available for the instructor **at the start of lab**. Your instructor will sign or initial and date these documents to indicate that they have been completed but allow you to keep them. **Failure to have them completed before the start of lab will result in dismissal from lab and a grade of "0" for the experiment.** These signed pages will be turned in with the rest of the report a week after the experiment is completed.

In-lab Activities and Assignment:

Although you will be working in pairs, each lab partner must write the experimental procedure in his/her own words, in passive voice (ie. The buret was rinsed...) as they are performing the

lab as well as collect and record the data and/or observations on the Custom Notebook pages (see Canvas for a detailed description for completing these pages). While conducting the experiment, it is the responsibility of each student to work safely and efficiently, to be mindful of their experimental technique, and to clean up their bench and common areas both as they conduct the lab and after the experiment is completed. **Before leaving the lab, it is the responsibility of each student to have their notebook pages signed and dated by their instructor and their partner.**

Post-lab Assignment:

Using the data and/or observations collected during lab, students will be expected to complete the “Calculations”, “Results”, and “Analysis of Error” portions of their notebook pages (see Canvas for a detailed description for completing these pages). In addition, students must complete a series of handout post-lab questions.

Submission and Evaluation of Lab Reports:

A completed lab report is worth a total of 12 points and comprises the following sections that must be clearly written, organized, and stapled in the following order (any order other than that listed below will result in the loss of 0.5 points):

Cover page (including experiment title, date performed, course/section, your name and partner, instructor and TCNJ logo).

Pre-lab handout questions (1 point)

Pre-lab notebook pages (2 points)

In-lab notebook pages with procedure, data and observations (4 points)

Your in-lab responsibilities as outlined in the “In-lab” paragraph above are also incorporated into this grade.

Calculations, Results, Analysis of Error notebook pages (3 points)

Post-lab handout questions (2 points)

Completed reports are due at the start of lab 1 week after the completion of the experiment. Late lab reports (any received after the start of the next lab) will be dropped 1 point for each day that they are late (including weekends). Lab reports that are a full week late will receive a score of zero.

Any student who has a documented disability and is in need of academic accommodations should notify the instructor of this course and contact the Office of Differing Abilities Services (609-771-2571.) TCNJ’s Americans with Disabilities Act policy is available at:

<http://policies.tcnj.edu/policies/digest.php?docId=8082>

Disability Support Services are available at:

<http://differingabilities.pages.tcnj.edu>

Any student sensing the need for tutoring should avail him/herself of the assistance from the Tutoring Center found in Roscoe L. West Hall, Suite 101, (609-771-3325) e-mail tutoring@tcnj.edu Additional information is available at:

<http://tutoringcenter.pages.tcnj.edu/>

A mid-semester progress report will be posted in PAWS Mar. 5-22, 2018 indicating whether a student’s progress is satisfactory, unsatisfactory or to caution students who are on the border of these two alternatives. It is hoped that this evaluation will initiate communication between the student and professor to allow improved performance in the course. **A minimum grade of C-**

is required in this course in order to continue in CHE310 or CHE331 and a minimum grade of C is required for retention in the chemistry major or minor.

Course Prerequisites: CHE201 or HON201 You must have earned a C- or better in CHE201 or HON201 to enroll in this CHE202 course. (See TCNJ Course Catalog)

Basic Course Information including learning goals and learning activities for CHE201-202

CHE 201 and/or 202 is a course designed for scientists, engineers or professionals in the other areas of the life sciences.

The major learning goal is to provide students with a general chemistry course that integrates all the major areas of chemistry, including theoretical, descriptive and practical aspects of chemistry. Students will develop insights into chemical concepts demonstrated by solving qualitative and conceptual as well as quantitative problems. A modern chemistry perspective is provided which encourages critical thinking, analytical reasoning and application of scientific principles. Throughout this two-semester course, the atomic and molecular structure is developed from modern quantum and molecular orbital theory. The laws and theories of matter are presented from both a thermodynamic and kinetic approach. The concepts of chemical equilibrium, and reaction kinetics and mechanisms, are developed from modern kinetic molecular theory. Physical properties of substances, aspects of chemical bonding, acid-base chemistry and oxidation-reduction reactions are studied. Basic concepts in nuclear chemistry are introduced.

Learning activities involve in-class lectures and discussions, on-line assignments, problem solving sessions, and weekly laboratory experiments designed to reinforce the topics addressed in lectures and train students in the design, execution and data analysis of meaningful experiments using current lab techniques and instrumentation. An appreciation of safe handling practices and the importance of following proper laboratory procedure are stressed.

Each student's performance is assessed based on four lecture exams, weekly graded laboratory reports, quizzes, and a comprehensive final exam. In CHE202, this final exam is the American Chemical Society's standardized General Chemistry examination covering the entire year's material. Each student's performance is evaluated in comparison to national norms on this examination.

The theoretical aspects addressed in the second semester of general chemistry are as follows. Nine chapters in Chemistry, 4th Ed. by Julia Burdge are covered in the order that follows (specific chapters and sections can be found on page 2 of this syllabus):

Intermolecular Forces and Physical Properties of Liquids and Solids

Intermolecular Forces
Properties of Liquids
Crystal Structure, Types of Crystals, Amorphous Solids
Phase Changes, Phase Diagrams

Properties of Solutions

Solutions
Concentration Units
Factors that Affect Solubility
Colligative Properties

Kinetics

Reaction Rates
Rate Laws
Collision Theory
Reaction Mechanisms

Chemical Equilibrium

Equilibrium Expressions and Constants
Factors that Affect Equilibrium

Acids and Bases

pH
Weak Acids and Weak Bases and Ionization Constants
Molecular Structure and Acid Strength
Acid Base Properties of Salt Solutions, Oxides and Hydroxides

Acid-Base Equilibria

Buffers
Titrations
Solubility Product

Thermodynamics

Entropy
Gibbs Free Energy

Electrochemistry

Galvanic Cells
Redox Reactions at Standard State and non-Standard State
Electrolytic Cells

Nuclear Chemistry

Spontaneous Decay and Transmutation Reactions
Dating
Fission and Fusion