

CHEM& 163 C/D

General Chemistry III • 6 CR

Spring Quarter 2022

Instructor: Dr. Daniel Mitchell

Office: S340K

Office Hours: MW: 1:30, TTh: 10:30, and after lecture Friday

Meeting times

Lecture: All: MWF 11:30AM-12:20PM in S323

Discussion: Section C: M 12:30PM-1:20PM in S323

Section D: W 12:30PM-1:20PM in S323

Lab: Section C: T 11:30AM-2:20PM in S316

Section D: Th 11:30AM-2:20PM in S316

Cell Phone: 206-660-2484

Office Phone: 425-564-2474

Email: dmitchel@bellevuecollege.edu

Prerequisite: CHEM 162 with a C or better

Textbooks and Equipment:

Required: Tro. "Chemistry, Structure and Properties" 2nd edition, Pearson Prentice Hall, 2017

Required: Soft-side safety goggles with splash guards (*available at bookstore*)

Required: Scientific or graphic calculator

Required: Modified Mastering Chemistry access (*see below*)

Required: Laboratory manual (check the schedule carefully each week to know what we are doing):

-- Online lab book: <http://scidiv.bellevuecollege.edu/Chemistry/>

Optional: Shaginaw, Tro. "Solutions Manual: Chemistry, Structure and Properties," Pearson Prentice Hall, 2017

Optional but highly recommended: A laminated periodic table-available at the BC bookstore and most other bookstores.

Optional but highly recommended: A notebook that is divided into clearly marked sections for lecture note-taking, text note-taking, workspace for problem solving, and questions to be asked in class, in group study, or during office hours.

Holidays: April 21st (Th), May 11th (W), May 30th (M), June 17th (F), June 20th (M)

Quarter: Fall Quarter runs from April 4th through June 23rd

Course Objectives: Third in a three-course introductory chemistry sequence intended for science and engineering students. It is expected that students have mastered the material from both 161 and 162 and are not in need of review. The material covered in this course includes: chemical equilibrium of aqueous solutions and multi-phase reactions, acid-base reactions and buffer systems, thermodynamics, entropy, free energy, electrochemistry, and transition metal chemistry.

Assigned Points (subject to change):

Exam 1 (Ch 15, Ksp, 16)	100 points
Exam 2 (Ch 16, 17)	100 points
Exam 3 (Ch 17, 18, 19)	100 points
Laboratory Portion	100 points
Quizzes (best 8 @ 10 points)	80 points
Online Homework	90 points
ACS Exam (multiple choice)	50 points
Final Exam (cumulative + Ch. 22)	200 points

Total	820 points

The grading scale will be a modified curve, if appropriate. You cannot do worse than the values given in the table above for a particular percentage of total points.

I will not apply a grading adjustment if the class average is higher than 75%.

Grade Point Based on a Percentage of Total Assigned Points

A	95-100
A-	90-94
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D	60-69
F	≤ 59%

Tentative

Course Outline and Test Schedule

Week	Day	PowerPoint outline and Chapter Reading Assignments
1	April 4-8	Ch. 15 – <u>Chemical Equilibrium</u>
2	April 11-15	Ch. 15 – <u>Continued and Ksp</u>
3	April 18-22	Ch. 16 – <u>Aqueous Equilibria: Acids and Bases</u> No Classes Thursday, April 21
4	April 25-29	Ch. 16 – <u>Continued</u> Exam #1: Monday, April 25
5	May 2-6	Ch. 17 – <u>Applications of Aqueous Equilibria</u>
6	May 9-13	Ch. 17 – <u>Continued</u> No Class Wednesday, May 11
7	May 16-20	Ch. 18 – <u>Thermodynamics: Entropy, Free Energy, Equilibrium</u> Exam #2: Friday, May 20 Sunday, May 22-Last Day to Withdraw (W)
8	May 23-27	Ch. 18 – <u>Continued</u>
9	May 30 – June 3	Ch. 19 – <u>Electrochemistry</u> No Class Monday, May 30
10	June 6-10	Ch. 19 – <u>Continued</u>
11	June 13-17	Ch. 22 – <u>Transition Elements and Coordination Chemistry</u> Exam #3: Monday, June 13 No Class Friday, June 17
12	June 21	Final Exam Tuesday, June 21st, 11:30AM-1:20PM

The final exam is cumulative.

The final exam will be given on Tuesday, June 21st, 11:30AM-1:20PM (both sections).

Laboratory Sessions for CHE 163

Tentative Lab Schedule

Week	Day (Section C) Tuesday	Day (Section D) Thursday	Experiment
1	April 5	April 7	NO LAB
2	April 12	April 14	Lab 1 – Equilibrium: Kc
3	April 19	April 21	NO LAB – Holiday
4	April 26	April 28	Lab 2 – Equilibrium Systems
5	May 3	May 5	Lab 3 – Acid/Base Titration, K _a
6	May 10	May 12	Lab 5 – pH Titration of Cola
7	May 17	May 19	Lab 4 – pH and Buffers
8	May 24	May 26	NO LAB – Gap week
9	May 31	June 2	Lab 6 – Thermodynamics
10	June 7	June 9	Lab 7 – Reduction Potentials
11	June 14	June 16	ACS Exam

Make sure you are preparing the right lab – always check this schedule

- ❖ Your 163 lab experience will be **significantly different** than it was for 161 and 162. There will be much more lab work to get done. There are standard lab expectations for all 163 students at Bellevue College. These expectations will be similar to your future science courses (such as ochem, biochem, upper division courses, etc).
- ❖ The laboratory portion of Chem 163 is worth 100 points. There are 7 labs worth 14 points each. And 2 points for the “notifications assignment” on week 1.
- ❖ **There are no make-up labs, there are no optional labs.**
- ❖ The online lab manual can be found at <http://scidiv.bellevuecollege.edu/chemistry/chem163/>
- ❖ It is *required* that you have a lab notebook. This is a good way to manage your prelabs, notes, data collected, and observations.
- ❖ I may swap Lab 4 and 5 around. Every time I teach this class I debate those two labs; usually it stays this way.

❖ **YOUR PRELAB:**

The Purpose, Method, Pre-lab questions, and a table for data collection are all required to be complete before you may begin work on the lab.

You may email this to me as an attachment by **7 pm** the night before your lab if you would like to begin on your lab immediately when lab time begins. OR, you will need to wait for me to come to your bench and approve your pre-lab work before you are allowed to begin working on the lab. I will be picky on this.

If you show up with nothing done, or have careless or sloppy work, you will lose **half** of the credit for that lab.

❖ **LAB REPORTS:**

Lab reports must be typed, but handwritten data entry and calculations are ok, as long as they are structured on the page so that they can easily be read. The general format for lab reports is as follows:

- 1) **Purpose** – identify: a) properties observed to change as a result of the experiment b) values that will be calculated using information gained by the observation and c) how you will assess the accuracy of your results.
- 2) **Method** – very brief description of overall procedure. You do NOT need to copy the entire procedure, just a summary of the method.
- 3) **Pre-lab questions** – you may supply a printed copy of the lab questions with your answers handwritten in the spaces (no need to re-type the questions), or simply type out answers without the questions, as long as you make it clear that the answers refer to the pre-lab questions (in this case complete sentences where appropriate).
- 4) **Data collection** – where necessary prepare a table. Be sure to include units. If a table is appropriate, it must be prepared PRIOR to lab.
- 5) **Data treatment** – ALL calculations must be neatly shown, and final results listed.
- 6) **Error analysis** – Indicate how you analyze your results in part 5 for error. This is a big part of your score.
- 7) **Conclusive remarks** – Refer to the initial purpose. Were you able to accomplish the goal? What were the challenges of this lab ... BE SPECIFIC!

Lab Safety: We will be using dangerous chemicals this quarter, and safety should be your primary concern. You are required to bring and wear goggles (I have none to lend) for each and every lab, even if the chemicals we are dealing with do not appear harmful, and to dress appropriately (no open toed shoes, shorts, or skirts). **Not remembering your goggles will cost you 2 points from the lab** (this is something I must enforce in 163!!!). Furthermore, if I have to continually remind you during the lab to wear your goggles, I will deduct points.

Lab Cleanup: On the first week of lab, each pair will “sign up” for a week where they are responsible for clean-up. They will need to stay and wait until everyone is done, and then clean up the entire lab. You’ll need to ensure not only are things clean, but that glassware is back in the proper location (there are diagrams to help with this). Everyone is still expected to do their best to clean up their own workstation, and the common areas. Creating an inordinate amount of mess and not cleaning it up will obviously not be acceptable by your peers or me (meaning you’ll lose points).

Other pieces of information or advice:

- All of the labs this quarter are done in pairs. Reports may be done individually or in pairs. Prelabs are individual.
- For part 5, error analysis: Analyze what should happen during the lab, including an analysis of error. Your explanations should have **valid scientific basis**, and be **relatively in depth**. If you cannot find any error in your data, hypothesize a reasonable potential source. For instance, if you’re doing a procedure – really anything in life, that is prone to error, you should be aware of those sources of error even if they didn’t affect you. For instance, we all understand the potential sources of error in driving to work. We also understand consequences of those errors. This is how you should evaluate the experiment. If you performed it as is a hundred times, where might problems arise?

Other Important Course Information

Chem 163 Course website—CANVAS:

I use CANVAS to post PowerPoint slides, online quizzes, handouts, answer keys, grades, discussion forums, etc... It is **required** that you log into CANVAS. All quizzes and exams will be given on Canvas.

- 1) Go to <http://bc.instructure.com>
- 2) Log in with your Bellevue College account information (be sure to check your BC email FREQUENTLY).
- 3) **Set your notifications to receive announcements “ASAP”. Send me a message once you have done this.** .
- 4) Browse around. Maybe setup an avatar, or put something about yourself in your profile.

Evaluation and Grading:

Tests and Final Exam: There will be three, 50-minute in-class tests scheduled on the dates given in the course outline. All new material covered after the last test and prior to one day before the test day is subject to examination. Appropriate older material may appear as well. The final examination is cumulative. The final exam will not be returned.

- ❖ You will have a 50 minute ACS General Chemistry Exam near the end of the year. This exam is an assessment of your general chemistry skills, and is **cumulative for the entire year** of general chemistry. It is multiple choice, it will be given in the lab, and it will count as 50 points of your final grade. All Bellevue College students must take this exam at the end of chemistry 163. Instructors have not seen the exam.

Online Quizzes: Every week you will receive a 10 point online quiz that is launched on **CANVAS** every Friday. This quiz must be completed by 11:55PM on the following Tuesday. The material covered on a particular quiz will be restricted to the current chapter being studied and the chapter preceding it.

Mastering Chemistry (Online Homework) Assignments:

I have assignments that will be due every **Wednesday** at 11:55 PM. They are required and are worth 10 points each, for approximately 90 points of your final grade. You will need to have an access code.

1. You already have access to Mastering through a BC program called inclusive access (IA) that you already have paid for with your tuition. IA includes the ebook plus mastering. You have two options:
 - a. Cancel IA and get a refund on that, and then buy Mastering direct.
 - b. Keep IA, and just click on the “Inclusive Access” link on the left menu in canvas and launch courseware.

Course Policies:

Tests, Quizzes, and Exams: Please be sure that you have no conflicts with the scheduled test/quiz dates as **NO** make-up tests/quizzes will be given, except in cases of **documented** illness or family emergency. If you know on the first day of class that you will not be here for a given test/quiz date, it is your responsibility to immediately inform me. If you inform me of a conflict less than two weeks in advance of a given test/quiz date I will not accommodate you. Students must notify me of an illness/emergency that will cause you to miss a test/quiz by leaving a message on my phone (206-660-2484) or by email (dmitchel@bellevuecollege.edu) prior to the start of a test/quiz. If you would like a test/quiz re-graded, you must submit it within one week of it being returned to you, with a note indicating specifically what you would like re-graded. The final exam is not optional! If you do not take the final, you will fail!

Attendance: I expect that you will make every attempt to be at all lecture meetings. It is the very rare instance that a student can do well in a course by attending few or no lectures. Don't attempt this! I really cannot help you if you try this and are unsuccessful in this class. If you miss a class, it is **your responsibility** to obtain lecture notes, handouts, assignments, announcements, etc. from other classmates, the library, the web, or Canvas. Please do not email me to ask what you missed.

Conduct: Rudeness, tardiness, chatter during lecture, and disrespect make learning difficult for everyone around you, and will not be tolerated. This also applies to cellular phones and beepers; turn these devices off during our class. If you must leave before class ends take your seat towards the back of the lecture room. You are responsible for all announcements, lecture notes, assignments, and handouts. Drinks with lids are permitted – any food you bring needs to be non-distracting.

Assigned Reading: Each week chapters have been assigned for reading (see schedule above). The expectation is that you have completed this reading before the beginning of the week in which it is covered in lecture. You are responsible for all material in the reading, including anything not covered in the lecture unless instructed that the material will be omitted. Be aware that the schedule is flexible; attendance in class will keep you up-to-date on the schedule.

Homework from the Text: If you wish to fully develop your problem solving skills to be evaluated on tests and quizzes, you should spend a minimum of **2 hours study outside of class for each hour of lecture**. You should not expect all problems on tests to be similar to those that you do for homework or to those covered in lecture. Your preparation for a test should include working problems that go beyond a given assignment.

Welcome

I am very glad you have chosen to study the amazing discipline of chemistry. It is a challenging and exciting subject. If you bring any doubts with you (“I failed high-school chemistry.”) or preconceptions (“Chemistry is for nerds.”), please park these feelings at the door. Chemistry is a central science that manifests itself in many areas of our lives. *What does it take to be successful in chemistry?* **First, be prepared.** Do the reading and assigned problems and think carefully about the work. Don't fall behind, since lecture will not be a rehash of text material. Strive to learn good note taking. **Second, ask questions.** You'll find that I won't have all the answers but I will try to steer you in the right direction to find that answer. You are also in the company of other learners (fellow students and other faculty)-ask them questions as well. I encourage the formation of study groups. These are successful only if everyone in the group has worked individually on the reading and homework prior to gathering the group members. **Third, practice.** I can't emphasize this enough. This may take the form of repeated readings, extra problem solving, organized memorization, and practice in verbalization and writing answers to questions.

Problem solving. Solving chemistry problems is demanding and requires that you use chemical language and concepts, and apply mathematical and reading skills. Frustration will likely affect you, at some point, as you work problems. Do not get discouraged! If you cannot solve a problem after two or three attempts, write down questions about aspects of the problem you do not understand. Then use your text, class time, group study, and office hours to get your questions answered.

Overcoming barriers to learning. Attitude and willingness to change unhelpful habits play major roles in your educational success. If you are firm in looking for “just the C” then you should look for the door out because you would be wasting your time and money and potentially that of your classmates. Rote memorization of text and problems is a bad habit that students resort to when overwhelmed or disorganized. Learn about lifelong, better study habits and skills by talking to the chemistry tutors in the Science Study Center (S100) and asking them how they became successful (425-564-3122). This Center also provides chemistry tutoring. Bottom line: All of you should talk to someone that you respect and know is a successful learner. **NOW!**

*** **The course outcomes for Chemistry 163** may be found at <http://www.bellevuecollege.edu/classes/All/CHEM%26/163>

BC Academic Success Center: <http://bellevuecollege.edu/asc> The ASC offers free tutoring, and paid positions for student tutors.

Counseling Services

These are tough times for many of us, financially, personally, emotionally. The BC Counseling Center is using a free and secure web-based program called Doxy.Me. This allows you to meet with a BC mental health counselor via video conferencing. Appointments are available Monday-Friday 8:00am – 5:00pm. Go to: <https://bellevuecollege.edu/counseling> or call them at 425-564-5747.

Other Offices and Resources:

Financial Aid | United Way Benefits Hub | The Women's Center and Center for Career Connections
Academic Advising | Flu Team: COVID-19 resource page

Science Division Policy on Cheating: You, the student, are expected to conduct yourself with integrity. If you cheat, or aid someone else in cheating, you violate a trust. Cheating includes, but is not limited to, copying answers on tests or assignments, glancing at nearby test papers, swapping papers, stealing, plagiarizing, and illicitly giving or receiving help on exams. If you cheat, the following actions will be taken:

- 1) You will receive a grade of zero on the work where the cheating occurred. This grade cannot be dropped.
- 2) A report of the incident will be sent to the Dean of Students. He/she may file a report in your permanent record of take further disciplinary action such as suspension or expulsion from the college.
- 3) If you feel you have been unfairly accused of cheating, you may appeal. For a description of the due process see WAC 132H-120.

Note that the college is constantly changing the grammar and phrasing of these following policies. The provided links should link to any updated language if it has changed since the quarter began.

The Disability Resource Center serves students with disabilities. Common disabilities include physical, neurological (e.g. Autism, ADD/ADHD), and mental health (e.g. depression, anxiety). If you are a student who has a disability or if you think you may need accommodations in order to have equal access in your classes, programs, activities, and any other services, please contact the DRC.

If you require assistance in an emergency, please meet with your individual instructors to develop a safety plan for while in class and contact the DRC to develop a safety plan for while you are elsewhere on campus.

The DRC office is located in building U Room 001. You can contact the DRC by stopping by the office at B132, calling our front desk phone number (425) 564-2498, emailing drc@bellevuecollege.edu. Deaf students can reach us by calling TTY: (425) 564-6189, or by Skype (account name **DRCatBC**). For more information about the services we offer, including our Initial Access Application, visit our website at [Disability Resource Center \(http://www.bellevuecollege.edu/drc\)](http://www.bellevuecollege.edu/drc).

Service Animals are allowed in this classroom. Emotional Support Animals need to be approved through the DRC. All other animals will be asked to leave. If you believe you need your animal with you, please connect with the DRC and refrain from bringing your animal until a decision has been made.

Affirmation of Inclusion

Bellevue College affirms the diversity of human identities and experiences and is committed to creating spaces free from harassment and discrimination (4000 Institutional Commitment to Inclusion). Furthermore, Bellevue College rejects all forms of racism, homophobia, sexism, xenophobia, religious intolerance, classism, ableism, ageism, language bias, and hate speech or actions that attempt to silence, threaten, or degrade others.

In classroom settings, we might disagree with views shared in the classroom; however, courteous, and respectful behavior and responses are always expected. When providing criticism, it is important to focus on the ideas and not the person.

Faculty are encouraged to disrupt and address hate speech and behaviors. Students are also encouraged to speak up and advocate when they experience, or witness hate speech and behaviors. Faculty, staff, and students also are encouraged to submit a report to the CARE Team regarding any concerns of discrimination, harassment, or inappropriate and disrespectful conduct.

[Affirmation of Inclusion](https://www.bellevuecollege.edu/inclusion/) (<https://www.bellevuecollege.edu/inclusion/>)

Reasons of Faith and Conscience

Reasonable Accommodations for Reasons of Faith and Conscience: Students who will be absent from course activities due to reasons of faith or conscience may seek reasonable accommodation so that grades are not impacted. Such requests must be made within the first two weeks of the course to the office of the Associate Vice President of Student Affairs (see Bellevue College Policy 2950 (<https://www.bellevuecollege.edu/policies/id2950/>)). In the event you feel you are being discriminated against based on faith or conscience, you may refer to the procedures outlined in the college's [Discrimination, Harassment and Retaliation Policy 1440P](https://www.bellevuecollege.edu/policies/id-1440p/) (<https://www.bellevuecollege.edu/policies/id-1440p/>).

Annual Notice Non-Discrimination

Bellevue College does not discriminate on the basis of race or ethnicity; creed; color; national origin; sex; marital status; sexual orientation; age; religion; genetic information; the presence of any sensory, mental, or physical disability; or veteran status in educational programs and activities which it operates. Bellevue College is prohibited from discriminating in such a manner by college policy and by state and federal law. All college personnel and persons, vendors, and organizations with whom the college does business are required to comply with applicable federal and state statutes and regulations designed to promote affirmative action and equal opportunity.

Reports of gender and sex-based based discrimination, sexual misconduct, or retaliation by a student should be raised with the Title IX office (see 1440P2 for contact information). In cases where the impacted party is a student and the responding party is a college employee, the Title IX coordinator will direct the matter to the Office of Human Resources (HR). All other reports, including all reports where the impacted party is an employee, should be raised with the HR. If a report is against personnel in the Title IX office or HR, it should be submitted to the president's office for referral to an alternate designee.

[Equal Opportunity](http://www.bellevuecollege.edu/equal/) (<http://www.bellevuecollege.edu/equal/>)

Confidentiality and Mandatory Reporting

As an instructor, one of my responsibilities is to help create a safe learning environment on our campus. It is my goal that you feel able to share information related to your life experiences in classroom discussions, in your written work, and in our one-on-one meetings. I will seek to keep information you share private to the greatest extent possible. However, I am required to share with the Title IX Coordinator any and all information regarding sexual assault and other forms of sexual misconduct (e.g. relationship violence, stalking) that may have occurred on campus or that impacts someone on campus. Students may speak to someone confidentially by contacting the BC Counseling Center at (425) 564-2212. The Title IX Office can be contacted at 425-564-2641 and more information can be found at [Title IX \(http://www.bellevuecollege.edu/titleix/\)](http://www.bellevuecollege.edu/titleix/).

If you have any concerns, you may report to: [Report Concerns \(https://www.bellevuecollege.edu/reportconcerns/\)](https://www.bellevuecollege.edu/reportconcerns/).

Student Conduct Code and Academic Integrity

Any act of academic dishonesty, including cheating, plagiarism (using the ideas or words of another as one's own without crediting the source), and fabrication, and inappropriate/disruptive classroom behavior are violations of the Student Conduct Code of Bellevue College. Examples of disruptive behavior include, but are not limited to, repeatedly talking out of turn, arriving late or leaving early without a valid reason, allowing cell phones to ring, and inappropriate behavior toward the instructor or classmates. The instructor can refer any violation of the Student Conduct Code to the Manager of Student Conduct for investigation. Specific student rights, responsibilities, and appeal procedures are listed in the Student Conduct Code at: [Student Code](#)