



SYLLABUS

CHEMISTRY 100: FOUNDATIONS OF CHEMISTRY (3 CREDITS)

SECTION 112 WINTER TERM 1 2019

Monday, Wednesday, and Fridays 12:00 - 12:50 pm in Chemistry D200 and Thursdays 12:30-1:20 pm in Chemistry D300

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TEACHING TEAM

INSTRUCTOR: JACLYN (JACKIE) STEWART, PH.D. PRONOUNS: SHE/HER/HERS

Please refer to me as Jackie or Dr. Stewart. Throughout this syllabus, "I" refers to me, Dr. Stewart.

Office: Chemistry D220.

Email: jstewart@chem.ubc.ca. I encourage you to send me messages using the Canvas inbox as you are likely to get a faster reply.

My drop-in office hours will be determined after an in-class poll of students' availability and will be posted on Canvas.

TEACHING ASSISTANT: TAYLOR WRIGHT. PRONOUNS: HE/HIM/HIS. Taylor will be facilitating the tutorials, holding drop-in office hours, facilitating online Q&A on Piazza, and assisting with grading. Please direct all grading inquiries to Dr. Stewart.

SCIENCE EDUCATION SPECIALIST: JEANETTE LEEUWNER, PH.D. PRONOUNS SHE/HER/HERS. You will see Jeanette in a few classes over the course of the term, as she is working on developing and evaluating this course.

ABOUT DR. STEWART

I am part of the first generation in my family to access post-secondary education. I grew up in Kamloops, British Columbia, and have lived in Vancouver for almost 20 years. After falling in love with chemistry in high school, I completed an honours Bachelor of Science degree in chemistry. I continued my education with a Master of Science in wood science, where I studied the chemical properties of natural and transgenic trees with respect to their paper-making properties. I then obtained my Doctor of Philosophy (Ph.D.) in educational psychology, where I investigated how students learn from online homework in organic chemistry. In addition to teaching general and organic chemistry, I teach science communication courses (SCIE 113, SCIE 300, CHEM 300). I am passionate about helping students implement evidence-based learning strategies. My current research interests include investigating how emotions influence learning from feedback, assessment of learning, and inclusive teaching. Please ask about my research if you would like to hear more! My hobbies include cooking, knitting, and listening to podcasts and nonfiction books. On the weekends, I'm often enjoying Pacific Spirit Park with my family, including our golden retriever dog Scottie.

WELCOME TO CHEM 100

Welcome to Chemistry 100: Foundations of Chemistry. We are incredibly fortunate to be learning together at the beautiful Point Grey Campus of UBC, which is on the traditional, ancestral, and unceded territory of the x̣ʷməθkʷəỵəm (Musqueam) people. The land UBC-V is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on their culture, history, and traditions from one generation to the next on this site.

I recognize that you are bringing your own goals, perspectives, and experiences to this course. My goal in teaching Chemistry 100 is to provide a learning environment in which all students can succeed. I aim to help you reach your goals for the course, and to instill a passion for learning that will help you excel in your later studies.

Please join me in working toward a classroom culture where everyone feels welcome and valued. UBC Positive Space Information can be found here (including resources on campus and a map of gender-inclusive washrooms): <https://equity.ubc.ca/resources/>. If you feel there is a course issue that is a barrier to your learning, please let me know. You can also contact the Ombudsperson for help: <https://ombudsoffice.ubc.ca/>.

Taking care of your mental health and wellbeing helps improve your academic performance. Sometimes it is possible to manage challenges on your own, while other times you may need support. UBC is committed to providing student mental health and wellbeing resources that meet your needs and help you achieve your goals. Visit <https://students.ubc.ca/health> for resources, strategies, and services to enhance your mental and physical health.

I am committed to equity, diversity, and inclusion. If you have a documented disability that affects your learning or exam performance, contact the Centre for Accessibility (Brock Hall 1203, 1874 East Mall, 604-822-5844). If your disability accommodations involve additional time on exams, please talk to me as soon as possible to discuss accommodation options for the course assessments.

CHEM 100 PREREQUISITES

CHEM 100 is not open to students with credit for Chemistry 12, and requires permission of the Chemistry Department Head, which involves the process of writing the Chemistry Basic Skills Test. This course will provide you with the foundations of chemistry required for first-year chemistry courses at UBC such as Chemistry 121.

COURSE-LEVEL LEARNING OUTCOMES

Chemistry is the branch of science that involves studying the composition and properties of matter and the nature of changes (“reactions”) matter undergoes. Being able to describe the ingredients in a cake and how they change when the cake is baked is chemistry. Chemists figure out how to make new chemicals (“synthetic chemistry”), analyze the identity and amount of chemicals in something (“analytical chemistry”), explain/discover laws about how the universe works, and more! Through this course, you will gain an appreciation for the important role of chemistry in society and recognize that chemicals make up virtually everything. More specifically, this term we will study atomic and molecular properties, chemical reactions, bonding, nomenclature (naming), and equilibrium processes. Specific topic-level learning objectives can be found on Canvas and in the course notes.

CLASS STRUCTURE AND PEDAGOGY

Generally, classes will include practice on previously learned content, mini-lectures about new content, and activities to help you make sense of new content. Some of the activities will involve worksheets that you work on during class and for homework. My expectation is that you will actively work to develop your understanding of course concepts **during** class. If you find you are often lost in class, please talk to me and we will develop a plan for how you can come to class better prepared. If you fully engage with the structure of the course (read notes before class, participate in activities during class, apply effective study techniques), you will **remember** the course content for a long time.

FORMATIVE ASSESSMENT

In learning chemistry, it is extremely important for you to receive timely, frequent feedback throughout the learning process. Feedback that helps you learn and directs your future learning is called **formative feedback**. Formative feedback can help prevent you from falling into the trap of the **illusion of knowing**, which is when you think you know something adequately, but you are actually just familiar with it. Formative feedback activities in this class include Learning Catalytics, Mastering Chemistry online homework, textbook problems, in-class retrieval practice, and quizzes.

ASSESSMENT PHILOSOPHY

All tests (two-stage quizzes and the final exam) in this course are cumulative. This means that any content taught before the test date may be included on the test. One reason for this is that chemistry concepts build on each other. It is not

possible to cleanly divide one topic from another. Additionally, research shows that repeated testing enhances long-term retention of facts, concepts, and skills. If you remember the CHEM 100 content, you will do better in later courses, such as Chemistry 121. Both multiple-choice/answer and open-ended questions will be used on quizzes and the final exam.

Frequent testing with feedback is strongly linked to improved learning. Frequent tests have been shown to increase motivation and retention of the material, even if they are low stakes. For this reason, we will have five course quizzes instead of a midterm examination. My hope is that the frequent quizzes will help you track how you are doing and motivate you to stay on top of the material. If one quiz doesn't go very well for you, that's ok since it isn't worth a large part of the course grade and you can make adjustments to your studying for future quizzes.

The five biweekly quizzes in this course are in the "two-stage exam" format. A two-stage exam involves you first writing the exam individually, then forming a team and writing the exam collaboratively. During the team portion, you will learn by discussing your answers with your group members and coming to a consensus as a group. Your individual score will count as 85% of the quiz grade, and the team portion will count as 15% of the quiz grade (a weighted average). If your individual score is higher than your team score, your individual score will count for the full 100% (this is uncommon since typically the group does better than the individuals making up the group).

Two-stage quizzes have been shown to enhance learning. The collaborative stage provides immediate feedback, so you get a sense of how you did before your quiz is returned to you. Chemistry students in the past have responded positively to two-stage exams and find them highly valuable.

QUIZ WRAPPERS

After each two-stage quiz, you will submit a post-quiz reflection about the effectiveness of your quiz preparation. You will receive credit for thoughtful reflection. The format of this quiz wrapper will be as a graded Canvas assignment.

WEEKLY REFLECTIONS "LEARNING PARAGRAPHS"

Each week, you will submit a learning reflection as a Canvas assignment (due Sundays at 9:00 pm). The purpose of these paragraphs is to help you determine how your learning is going and what you need to do differently going forward. The paragraphs will also help me keep track of how the course is going for you, and to provide additional support if needed.

LEARNING TOOLS

TEXTBOOK – INTRODUCTORY CHEMISTRY (TRO), 6TH EDITION

The electronic version of the textbook has a lot of useful interactive elements such as videos and tutorials. Check it out!

I am also offering a free, open education resource version of the course textbook using the platform LibreTexts. You can use this as an alternative to the textbook. Your feedback on this version is welcome. The content can be found here:

https://chem.libretexts.org/Courses/University_of_British_Columbia/CHEM_100%3A_Foundations_of_Chemistry

COURSE NOTES

I will post a PDF file of each chapter's notes on Canvas. Please print this note package so you can add your own notes during class. It is very important that you read the notes before coming to class. After every class, I will post my annotated version so you can fill in anything you missed.

CALCULATOR

The calculator permitted by the Department of Chemistry is the Sharp EL-510RNB, which can be purchased from the UBC Bookstore. Please bring this calculator to all classes (including tutorials and quizzes).

CANVAS (LEARNING MANAGEMENT SYSTEM) WWW.CANVAS.UBC.CA

Our central "hub" for the course is our Canvas site. Be sure you have your Canvas settings for announcement notifications turned on.

PIAZZA (ACCESS VIA CANVAS)

Piazza is highly catered to getting you help fast and efficiently from classmates, the TA, and me. If you have any problems or feedback for the developers, email team@piazza.com. Find our class page using the left-hand menu on Canvas.

We encourage you to answer other students' questions as much as possible. The teaching team will guide the discussion and correct misconceptions as they come up. You should post chemistry questions on Piazza instead of sending them to the instructor or TA via email. This way, the entire class can see the answer and we won't have to answer the same

question multiple times. Chances are if you are thinking of a question, someone else in the class is too!

To encourage you to learn from Piazza, I will be awarding the top 3 student contributors with a 1% bonus on their course grade. The top three students will be based on a combination of instructor/TA-endorsed “good questions”, endorsed answers, and the amount of content you read.

MASTERING CHEMISTRY ONLINE HOMEWORK (INSTRUCTIONS ARE ON CANVAS)

Weekly homework will be completed online using Mastering Chemistry, which can be purchased alone or is bundled with the textbook Introductory Chemistry (Tro).

Mastering Chemistry is a cloud-based service. If you are concerned about having your personal information stored in the cloud, you can use an alias (alternative name and anonymous email address for registration). If you use an alias, please let Dr. Stewart know.

LEARNING CATALYTICS

Learning Catalytics (LC) is a powerful “bring-your-own-device” classroom response system. You can use any modern web-enabled device, including laptops, smartphones (iPhone, Android, Blackberry, and so on), and tablets (iPad, Kindle Fire, and others). Please select the smallest device you own to avoid the room being overrun by large, unnecessary, laptops. If you do not own a device, please speak to me, and/or borrow a device from UBC’s library lending program <https://services.library.ubc.ca/computers-technology/technology-borrowing/>.

Learning Catalytics takes the place of the “iClicker”. We are not using iClicker in CHEM 100.

It is imperative you use electronic devices responsibly during class. Devices should support learning, not distract from it. Be sure not to distract others with the content on your device.

Learning Catalytics is a cloud-based service. If you are concerned about having your personal information stored in the cloud, you can use an alias (alternative name and anonymous email address for registration). If you use an alias, please let Dr. Stewart know.

ASSESSMENT OF LEARNING

Your course grade will be calculated using the following grading scheme:

Activity	Weight (%)
Mastering Chemistry Online Homework	10
Learning Catalytics	5
Class Worksheets	5
Tutorial Worksheets	4
Learning Paragraphs and “Quiz Wrappers”	6
Five Biweekly Quizzes (lowest score dropped)	28
Final Examination	40
Survey Participation	2
Total	100

GRADING SCHEME NOTES:

- Your lowest quiz grade will be dropped. If you miss ONE quiz, that quiz will be the one that is dropped. Missing more than one quiz will result in a grade of zero for the additional missed quizzes unless you obtain academic concession.
- Surveys will be offered throughout the term to help improve the course. Your participation is appreciated, and you will be awarded the course grade component regardless of how you answer the surveys. There will also be opportunities for you to participate in education research conducted by UBC researchers. More information will be presented in class.

HOW TO GET HELP

There are many ways for you to get help with course content. Ask questions on Piazza, attend instructor and TA drop-in office hours, and work with others in a study group. For general academic help, consider accessing the help provided by Science Peer Academic Coaches. More information about SPAC can be found here: <https://science.ubc.ca/students/spac>. Most importantly, if you find you are struggling with CHEM 100, ask for help. The longer you delay seeking assistance, the more difficult it will be to regain your footing.

UNIVERSITY POLICIES

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions.

Details of the policies and how to access support are available on [the UBC Senate website](#).

COURSE POLICIES

CLASS ATTENDANCE

Please do not miss any classes if you can help it. I will post class notes on Canvas, but it is important to take your own notes during class and learn from our problem-solving exercises.

We will use Learning Catalytics every class (except for the first class and Thursday sessions). Your participation for each class is weighted equally, no matter how many Learning Catalytics questions we work through. Within a class, all Learning Catalytics questions are weighted equally for participation purposes. Learning Catalytics will be used for conceptual practice (participation points) and quick quizzes (participation + correctness points).

ACADEMIC CONCESSIONS (INCLUDING MISSED CLASSES AND QUIZZES)

For the first occurrence of an acute illness (cold, flu or other) or compassionate grounds, a **self-declaration** will suffice. To request academic concession, use the self-declaration form on Canvas. A doctor's note is NOT required for this request. If you have an ongoing issue including: conflicting responsibilities, medical circumstance, or compassionate ground (e.g. death in the family) please contact your Faculty's advising office for guidance.

Once academic concession is granted, the weight of the missed assignment or quiz will be redistributed to the other course items of the same type. If you miss the **final examination** for reasons such as illness or family crisis, you must inform your Faculty's advising office of the reason for the absence in a timely manner (within a few days).

Note that if you are ill for a quiz or exam and choose to write it, then the grade obtained on the examination will stand. **There are no rewrites or make-ups of quizzes or the final examination.**

QUIZ AND EXAM REGRADES

If you notice a potential grading error on an assignment or quiz, notify Dr. Stewart as soon as possible.

To request a regrade of your **final examination** you must apply for a Review of Assigned Standing. Information on this process is found here: <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,49,0,0>.

LEARNING ANALYTICS

Learning analytics includes the collection and analysis of data about learners to improve teaching and learning. This course will be using the following learning technologies: Canvas, Piazza, Learning Catalytics, and Mastering Chemistry. Many of these tools capture data about your activity and provide information that can be used to improve the quality of teaching and learning. In this course, I may use analytics data to:

- View overall class progress
- Track your progress in order to provide you with personalized feedback
- Review statistics on course content being accessed to support improvements in the course
- Track participation in discussion forums
- Assess your participation in the course

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