



SYLLABUS

CHEMISTRY 100: FOUNDATIONS OF CHEMISTRY (3 CREDITS)

SECTION 112 WINTER TERM 1 2020 (ONLINE)

Monday, Wednesday, and Fridays 12:00 - 12:50 pm and Thursdays 8:00 – 8:50 pm

TABLE OF CONTENTS

| | Page | | Page | | Page |
|---|------|-------------------------|------|--------------------------------|------|
| Teaching team | 1 | Quiz/midterm wrappers | 4 | Policies | 5 |
| About Dr. Stewart | 1 | Weekly reflections | 4 | Class attendance | 5 |
| Welcome to CHEM 100 | 2 | Learning tools | 4 | Academic integrity | 5 |
| CHEM 100 prerequisites | 2 | Technology requirements | 4 | Academic concessions | 6 |
| Course-level learning outcomes | 2 | Textbook | 4 | Quiz and exam regrades | 6 |
| Class structure and learning methods | 2 | Canvas | 4 | Learning analytics | 6 |
| Assessment philosophy | 3 | Microsoft Teams | 4 | For students outside of Canada | |
| Formative feedback | 3 | Mastering Chemistry | 4 | Copyright | 6 |
| Frequent assessment | 3 | Learning Catalytics | 4 | Course schedule | 7 |
| Collaborative learning | 3 | How to get help | 5 | Acknowledgements | 8 |
| Grading scheme | 3 | | | | |

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.

Feel free to contact me by sending a message through Canvas or use @jaclyn.stewart to mention me in Microsoft Teams.

TEACHING ASSISTANT: TAYLOR WRIGHT. PRONOUNS: HE/HIM/HIS

Taylor will be facilitating activities and Q&A, holding drop-in office hours, and assisting with grading. However, please direct all questions about your grades to Dr. Stewart.

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 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. Scottie and I are looking forward to meeting you this term!

WELCOME TO CHEM 100

Welcome to Chemistry 100: Foundations of Chemistry. The Point Grey Campus of UBC is on the traditional, ancestral, and unceded territory of the x̣ṃəθḳẉəỵəm (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. This year, while we learn together with short or great distances between us, I will be on the traditional, ancestral, and unceded territories of the Musqueam, Tsleil-Waututh, and Squamish nations.

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 class culture where everyone feels welcome and valued. A comprehensive list of resources from the Equity and Inclusion Office is here: <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. Self-care and compassion are especially important during this pandemic, which is an especially challenging time for all of us.

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 (<https://students.ubc.ca/about-student-services/centre-for-accessibility>). 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 120/121.

WHAT IS CHEMISTRY? 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. For example, being able to describe the ingredients in a cake and how they change when the cake is baked displays knowledge of 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 LEARNING METHODS

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 online worksheets that you work on during class and for homework. Sometimes, you will work with other students. My expectation is that you will actively work to develop your understanding of course concepts **before, during, and after** class. If 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. I expect you to participate in the synchronous class sessions, but if it is a burden to attend class regularly at the scheduled time, please discuss this with me as soon as possible and we will work out a solution.

ASSESSMENT PHILOSOPHY

FORMATIVE FEEDBACK

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. I have planned many opportunities for you to obtain feedback, such as in-class Learning Catalytics questions, Mastering Chemistry online homework, textbook problems, in-class retrieval practice, and quizzes.

FREQUENT ASSESSMENT

All tests (quizzes, midterm, 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 120/121. 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 in addition to a midterm examination. My hope is that this “continuous assessment” 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.

COLLABORATIVE LEARNING

The midterm and final exam will be in the two-stage exam format. A two-stage exam involves you first writing the exam individually, then writing the exam collaboratively in a team. 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 exam grade, and the team portion will count as 15% of the exam grade (a weighted average). If your individual score is higher than your team score, your individual score will count for the full 100%. Two-stage exams have been shown to enhance learning. The collaborative stage provides immediate feedback, so you get a sense of how you did before your exam is returned to you. Past students have found two-stage exams to be valuable to their learning. They are also fun!

GRADING SCHEME

| Activity | Weight (%) |
|-------------------------------------|------------|
| Mastering Chemistry Online Homework | 15 |
| Learning Catalytics | 5 |
| Class Worksheets | 8 |
| Learning Paragraphs / Wrappers | 4 |
| Four Biweekly Quizzes | 24 |
| Midterm Examination | 10 |
| Final Examination | 30 |
| End-of-Term Review Assignment | 2 |
| Survey Participation | 2 |
| Total | 100 |

GRADING SCHEME NOTES:

- Make-up quizzes are available in the event you need to miss a quiz for illness or another reason requiring concession. See section below on “Academic Concession”.
- Quiz re-takes are also available (details TBA).
- Dr. Leeuwner will be collecting your feedback on the course and instruction via surveys (results will be anonymized before I see them). Your participation is appreciated, and you will be awarded the course grade component regardless of how you answer the surveys. There may also be opportunities for you to participate in research studies conducted by UBC researchers. More information on research participation will be presented during the term.

QUIZ/MIDTERM WRAPPERS

After each term assessment, you will complete a “wrapper” which is an exercise designed to help you reflect on your knowledge, learning, and testing experience. You will receive credit for thoughtful reflection. The quiz wrappers are Canvas assignments.

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

TECHNOLOGY REQUIREMENTS

This remote course requires access to a computer with stable high-speed Internet connection, camera, and microphone for class sessions and assessments. The technology requirements for remote courses at UBC are described in detail on this website: <https://keeplearning.ubc.ca/setting-up/>

If you are concerned about your access to the necessary technology, please contact your Enrolment Services advisor to discuss options for bursaries or other work-arounds. More information can be found on this website: <https://students.ubc.ca/about-student-services/enrolment-services-advisors>

TEXTBOOK – INTRODUCTORY CHEMISTRY (TRO), 6TH EDITION

The electronic version of the textbook has a lot of useful interactive elements such as videos and tutorials. If you prefer, binder-ready “loose-leaf” and hardcover versions of the book are available.

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.

MICROSOFT TEAMS

We will be using Microsoft Teams for collaborating on worksheets and activities, as well as for course and chemistry Q&A. Instructions for joining Teams are here: <https://keptteaching.ubc.ca/files/2020/08/microsoft-teams-student-guide.pdf>

MASTERING CHEMISTRY ONLINE HOMEWORK (INSTRUCTIONS ARE ON CANVAS)

Required weekly homework will be completed online using Mastering Chemistry, which can be purchased alone or is bundled with the textbook.

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 me know what it is.

LEARNING CATALYTICS

Learning Catalytics 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). Sign into Learning Catalytics from within Mastering Chemistry. I will provide you with the Learning Catalytics session ID at the start of class.

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 me know what it is.

HOW TO GET CHEMISTRY HELP

There are many ways for you to get help with course content. Ask questions, attend instructor and TA drop-in help 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.

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](#).

CLASS ATTENDANCE

Please do not miss any classes if you can help it. We will use Learning Catalytics every class. 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 INTEGRITY

As a student, your number one task is to learn new things. Just like your professors, however, you are a member of a university scholarly community. As a part of this community, you are responsible for engaging with existing knowledge and contributing ideas of your own. Academics—including you!—build knowledge through rigorous research that expands on the contributions of others, both in the faraway past and around the world today. This is called scholarship. Academic integrity, in short, means being an honest, diligent, and responsible scholar. This includes:

- Accurately reporting the results of your research, e.g., when collecting data in a lab.
- Taking exams without cheating.
- Completing assignments independently or acknowledging collaboration when appropriate. Collaboration through group work is an effective way to learn. I will clearly indicate when you should collaborate, for example during in-class group work and on some online homework assignments.
- Creating and expressing your own original ideas.
- Engaging with the ideas of others, both past and present, in a variety of scholarly platforms such as research journals, books by academics, lectures, etc.
- Explicitly acknowledging the sources of your knowledge, especially through accurate citation practices.

Any instance of cheating or taking credit for someone else's work, whether intentionally or unintentionally, may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences.

To help you learn your responsibilities as a scholar, please read and understand UBC's expectations for academic honesty in the UBC Calendar: "[Academic Honesty](#)," "[Academic Misconduct](#)," and "[Disciplinary Measures](#)". Read and reflect on the [Student Declaration and Responsibility](#). There are resources to help you meet these expectations, for example the Chapman Learning Commons "[Understand Academic Integrity](#)".

Feel free to ask me about academic integrity. Part of my job is to guide your growth as a scholar, and I would much rather you ask for clarification than unintentionally engage in academic misconduct, which has serious consequences.

Sometimes students who are experiencing a lot of stress feel the only way to deal with a situation is to cheat. Please do not do this. Talk to me, and I am sure we can work something out together.

ACADEMIC CONCESSIONS (INCLUDING MISSED QUIZZES/MIDTERM)

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 this form: <https://xenon.chem.ubc.ca/sdoac/>. 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.

Make-up quizzes are available with an approved academic concession. If you miss the midterm exam, the final exam will be worth 40% of your overall grade. 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.

QUIZ AND EXAM REGRADES

If you notice a potential grading error on an assignment or quiz, notify me 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, Zoom, Microsoft Teams, Learning Catalytics, and Mastering Chemistry. Some 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

FOR STUDENTS OUTSIDE OF CANADA

During this pandemic, the shift to online learning has greatly altered teaching and studying at UBC, including changes to health and safety considerations. Keep in mind that some UBC courses might cover topics that are censored or considered illegal by non-Canadian governments. This may include, but is not limited to, human rights, representative government, defamation, obscenity, gender or sexuality, and historical or current geopolitical controversies. If you are a student living abroad, you will be subject to the laws of your local jurisdiction, and your local authorities might limit your access to course material or take punitive action against you. UBC is strongly committed to academic freedom, but has no control over foreign authorities (please visit <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,33,86,0> for an articulation of the values of the University conveyed in the Senate Statement on Academic Freedom). Thus, we recognize that students will have legitimate reason to exercise caution in studying certain subjects. If you have concerns regarding your personal situation, consider postponing taking a course with manifest risks, until you are back on campus or reach out to your academic advisor to find substitute courses. For further information and support, please visit: <http://academic.ubc.ca/support-resources/freedom-expression>.

COPYRIGHT

All materials of this course (course handouts, lecture slides, assessments, course readings, etc.) are the intellectual property of the Course Instructor or licensed to be used in this course by the copyright owner. Redistribution of these materials by any means without permission of the copyright holder(s) constitutes a breach of copyright and may lead to academic discipline.

Classes and office hours will be held on Zoom, which is integrated with our Canvas course. Please note that Zoom lectures will be recorded and posted to Canvas – all recordings will be kept secure, and will only be available to students enrolled in the course. Do not distribute audio or video recordings of the class sessions as doing so is a copyright violation as well as violation of your classmates' and instructor's privacy.

COURSE SCHEDULE

The overall course schedule, with assessment dates, is shown below. The chapter dates are subject to change.

| Week | Date | Day | Content | |
|------|--------|-----------|------------------------------------|--|
| 1 | 09-Sep | Wednesday | Onboarding | WEEKLY ROUTINE Sundays: Learning Paragraphs / Wrappers due before midnight Mondays: Mastering Chemistry due before class Every-other Thursday: Quiz on Canvas. On Thursdays that have a quiz, there is no class meeting. Pre-class and post-class activities: From time-to-time I will assign a short video or reading before class. I may also ask you to do worksheet questions in between classes. Marks for these will manifest in the worksheet or Learning Catalytics grades. |
| | 10-Sep | Thursday | Onboarding | |
| | 11-Sep | Friday | Onboarding | |
| 2 | 14-Sep | Monday | Chapter 2 | |
| | 16-Sep | Wednesday | | |
| | 17-Sep | Thursday | Chapter 3 | |
| 3 | 18-Sep | Friday | | |
| | 21-Sep | Monday | Chapter 4 | |
| | 23-Sep | Wednesday | | |
| | 24-Sep | Thursday | Quiz #1 Chapters 2 and 3 | |
| 4 | 25-Sep | Friday | | |
| | 28-Sep | Monday | Chapter 5 | |
| | 30-Sep | Wednesday | | |
| | 01-Oct | Thursday | | |
| 5 | 02-Oct | Friday | | |
| | 05-Oct | Monday | Chapter 6 | |
| | 07-Oct | Wednesday | | |
| | 08-Oct | Thursday | Quiz #2 Chapters 2-5 | |
| 6 | 09-Oct | Friday | | |
| | 12-Oct | Monday | Thanksgiving Holiday (no class) | |
| | 14-Oct | Wednesday | Chapter 7 | |
| | 15-Oct | Thursday | | |
| 7 | 16-Oct | Friday | | |
| | 19-Oct | Monday | Chapter 8 | |
| | 21-Oct | Wednesday | | |
| | 22-Oct | Thursday | Midterm Exam Chapters 2-7 | |
| 8 | 23-Oct | Friday | | |
| | 26-Oct | Monday | Chapter 9 | |
| | 28-Oct | Wednesday | | |
| | 29-Oct | Thursday | | |
| 9 | 30-Oct | Friday | | |
| | 02-Nov | Monday | Chapter 10 | |
| | 04-Nov | Wednesday | | |
| | 05-Nov | Thursday | Quiz 3 Chapters 2-9 | |
| 10 | 06-Nov | Friday | | |
| | 09-Nov | Monday | Chapter 12 | |
| | 11-Nov | Wednesday | Remembrance Day Holiday (no class) | |
| | 12-Nov | Thursday | | |
| 11 | 13-Nov | Friday | | |
| | 16-Nov | Monday | Chapter 13 | |
| | 18-Nov | Wednesday | | |
| | 19-Nov | Thursday | Quiz 4 Chapters 2-10, 12 | |
| 12 | 20-Nov | Friday | | |
| | 23-Nov | Monday | Chapter 14 | |
| | 25-Nov | Wednesday | | |
| | 26-Nov | Thursday | | |
| 13 | 27-Nov | Friday | | |
| | 30-Nov | Monday | Chapter 15 | |
| | 02-Dec | Wednesday | | |
| | 03-Dec | Thursday | Wrap Up (last class) | |
| | 04-Dec | Friday | End-of-Term Review Assignment Due | |

The final exam is scheduled by the University between Dec. 7 and 22, and will be announced sometime in October.

Version: September 7th, 2020

ACKNOWLEDGEMENTS

Dr. Jeanette Leeuwner developed CHEM 100, and taught it, during the 2018-2019 academic year. I am grateful to her for developing the first version of the course notes as well as providing advice about the course content and assessment.

I adapted the Academic Integrity portion of this syllabus from Dr. Laurie McNeill, Department of English.