

**CHM 135H: Chemistry: Physical Principles**  
**Course Syllabus: Fall 2020**



**I CONTACTS**

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**INSTRUCTORS**

<p style="text-align: center;">Dr. K. Quinlan Course coordinator, First third synchronous sessions <a href="mailto:kristine.quinlan@utoronto.ca">kristine.quinlan@utoronto.ca</a></p> 	<p style="text-align: center;">Professor S. Browning First third asynchronous sessions &amp; student hours <a href="mailto:cs.browning@utoronto.ca">cs.browning@utoronto.ca</a></p> 
<p style="text-align: center;">Professor G. Walker Middle third synchronous sessions <a href="mailto:gilbert.walker@utoronto.ca">gilbert.walker@utoronto.ca</a></p> 	<p style="text-align: center;">Professor M. W. B. Wilson Middle third asynchronous sessions &amp; student hours <a href="mailto:mark.w.b.wilson@utoronto.ca">mark.w.b.wilson@utoronto.ca</a></p> 
<p style="text-align: center;">Dr. J. De Backere Last third synchronous sessions <a href="mailto:john.debackere@utoronto.ca">john.debackere@utoronto.ca</a></p> 	<p style="text-align: center;">Professor R. Jockusch Last third asynchronous sessions &amp; student hours <a href="mailto:rebecca.jockusch@utoronto.ca">rebecca.jockusch@utoronto.ca</a></p> 

**STUDENT HOURS:** Tuesdays at 3-4 pm EDT and Wednesdays at 9-10 am EDT via Zoom

<p><b>PRACTICAL INSTRUCTOR</b> Dr. G. Harewood <a href="mailto:g.harewood@utoronto.ca">g.harewood@utoronto.ca</a></p>  <p><b>PRACTICAL STUDENT HOURS</b> (via Zoom) Tuesday 9-10 am EDT Wed 9-10 am EDT and 8-9 pm EDT Thurs 8-9 pm EDT Fri 3-4 pm EDT</p>	<p><b>COURSE ADMINISTRATOR</b> Dr. S. Chulliparambil <a href="mailto:susha.chulliparambil@utoronto.ca">susha.chulliparambil@utoronto.ca</a></p> 
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## II COURSE OVERVIEW

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**Welcome to CHM 135H – Chemistry: Physical Principles!** CHM 135H is designed to provide a foundation in physical chemistry for students who intend to follow a science program, primarily in the Life or Health Sciences. Along with CHM 136H (Introductory Organic Chemistry I), these are also the recommended courses for those applying for entry into professional programs. CHM 135H and CHM 136H are also acceptable for admission to any of the undergraduate programs offered by the Department of Chemistry. Chemistry SCH4U and Mathematics MHF4U + MCV4U are pre-requisites for CHM 135H, and this course is a pre-requisite for CHM 136H.

### STUDENT LEARNING OUTCOMES:

By the end of CHM 135H, successful students will be able to

- describe macroscopic properties of molecules and explain how atomic or molecular behavior accounts for those properties, including in everyday situations.
- solve quantitative chemical problems and interpret the solutions in consideration of molecular behaviour
- appreciate the interdisciplinary nature of chemistry and relate chemical concepts to problems in other disciplines

### TEXTBOOK AND ONLINE HOMEWORK:

The course textbook is "Chemistry: The Molecular Nature of Matter and Change" 9th Edition by Martin Silberberg and Patricia Amateis with "Connect", the accompanying online homework system. The textbook is available either as a print book or e-book and both include with a Connect access code. These resources are available through the [U of T Bookstore](#) at reduced cost.

### III HOW THE COURSE IS ORGANIZED

During Fall 2020, CHM 135H will be offered fully online, so there is **no in-person scheduled classroom time**. Each week, you will watch pre-recorded (asynchronous) videos, attend live (synchronous) problem-solving classes, complete online homework and textbook problems, and attend live (synchronous) tutorial sessions. In lieu of in-person laboratories this year, you will also complete five virtual experiments and meet synchronously five times to discuss those experiments over the course of the semester. There will be online student hours for both the “class” and “practical” content to support your learning.

In your CHM 135H LEC section tile on Quercus, asynchronous videos and partial notes will be provided. While watching the videos, you should fill in these incomplete notes during each video. This activity should be completed **before** your weekly synchronous problem-solving class, in order to fully engage with them. You will join each synchronous class in Zoom, which can be accessed through your CHM 135H LEC course tile in Quercus. You can also access the class student hours via Zoom in the same manner. These student hours will give you the opportunity to discuss the course content with your instructors and other students.

CHM 135H will cover the physical principles important in chemistry:

Week	Topic	Textbook Chapters	Synch Session week of	Online Homework due	Tutorial week of
1	High school refresher	Ch. 1-4 (parts only)		Sept. 21 9 pm EDT	Sept. 21
2	Quantum Theory and Atomic Structure	Ch. 7, 8	Sept. 14	Sept. 28 9 pm EDT	Sept. 28
3	Bonding, Intramolecular Forces, Gases	Ch. 9, 10, 12.3, 5	Sept. 21	Oct. 5 9 pm EDT	Oct. 5
4	States of Matter, Solids, Liquids, Phase Changes, Solutions	Ch. 12.1, 12.4, 12.6, 13.1, 13.3, 13.4, 13.5, 13.6	Sept. 28	Oct. 13 9 am EDT*	Oct. 12
5	Kinetics	Ch. 16	Oct. 5	Oct. 19 9 pm EDT	Oct. 19
6	Equilibrium	Ch. 17	Oct. 12	Oct. 26 9 pm EDT	Oct. 26
7	Acids and Bases	Ch. 18	Oct. 19	Nov. 2 9 pm EDT	Nov. 2
8	Buffers, Titrations, Solubility	Ch. 19	Oct. 26	Nov. 16 9 pm EDT	Nov. 16
9	Thermochemistry	Ch. 6.1-6.6	Nov. 2	Nov. 23 9 pm EDT	Nov. 23
10	Thermodynamics	Ch. 20.1-20.4	Nov. 16	Nov. 30 9 pm EDT	Nov. 30
11	Electrochemistry	Ch. 20.4, 4.4, 4.5, 21.1-21.4	Nov. 23	Dec. 7 9 pm EDT	Dec 7
12	Electrochemistry	Ch. 21.5-21.7	Nov. 30		

\* Due to Thanksgiving Monday, the online homework will be due Tuesday morning.

Note: The textbook chapters are a rough guide to the material. We will not cover all parts of each chapter section.

In addition to student hours, we will be using Piazza, a free platform that facilitates online Q&A discussions. Information on how to join Piazza can be found in Announcements in your Quercus CHM 135H LEC course tile. We highly encourage you to ask your content questions on Piazza where all students can benefit. Let's all learn together! The teaching team will be monitoring the discussion board and providing input as needed, although we expect students to help each other. Note that sharing solutions of any sort to the online homework problems is in violation of University of Toronto's Code of Behaviour on Academic Matters (see Academic Integrity section of syllabus.)

## TUTORIALS

Tutorial sessions will meet each week synchronously starting on the week of Sept. 21<sup>st</sup>. **It is essential that you have enrolled in a tutorial section through ACORN/ROSI.**

The objectives of the CHM 135H tutorial are (i) to re-visit the course content seen in the videos and in the problem-solving classes; (ii) to solve challenging problems in smaller groups and with your teaching assistant; and (iii) to give you an opportunity to ask questions in a smaller group environment. These smaller tutorial sessions will also provide a chance to meet your peers and build a community within the large course. In your CHM 135H TUT course tile in Quercus, you will find the following information:

- 1) A link to the online homework system
- 2) Weekly textbook problems and solutions
- 3) A discussion board to meet your peers
- 4) Links to synchronous tutorial sessions via Zoom

The online homework problems will be due each Monday, starting on Sept. 21<sup>st</sup>. Both the online homework and the assigned textbook problems should also be completed **before** your synchronous tutorial session. **Active student participation in problem solving through completion of homework is linked to success in learning chemistry:** the online homework, as well as the assigned textbook problems, will provide you an important opportunity for self-assessment, help you make sure you are keeping up with the course materials and are essential preparation for tutorial. During your tutorial sessions, your tutorial teaching assistant (TA) will discuss any questions that you may have concerning the assigned exercises and assist you in understanding the important concepts of the course material.

Chemistry is an area of study that relies on problem-solving. In order to learn chemistry and be successful on the course assessments, you need to **practice**. Remember that you are the best judge of your own learning (provided you are honest with yourself).

## PRACTICALS

In CHM 135H, you will carry out, record and interpret the results of five virtual chemistry experiments. Each experiment will consist of a module on the CHM 135H PRA course tile on Quercus. You will work through the experiment **before** meeting with your practical group and

teaching assistant to discuss your experimental results and prepare for completing the report sheet for the experiment. More details are available on the CHM 135H PRA course tile on Quercus. You can also access the practical student hours through the Practical course tile.

PRA section codes ending in an odd number will begin the week of September 21, 2020 and will run on alternating weeks. PRA sections ending in an even number will begin the week of September 28, 2020 and run on alternating weeks. **It is essential that you have enrolled in a practical section through ACORN/ROSI.**

## IV GRADING SCHEME

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Online homework: 5%

Practical: 30%

Test 1: Tuesday, Oct. 13<sup>th</sup> 7-8 pm EDT: 15%\*

Test 2: Tuesday, Nov. 3<sup>rd</sup> 7-8 pm EST: 15%\*

Test 3: Monday, Nov. 30<sup>th</sup> 7-8 pm EST: 15%\*

Test 4: (during final assessment period, date TBD): 15%\*

\* the highest of the four test scores will be weighted at 20%, such that the four tests will account for 65% of the final course grade

All tests in CHM 135H will be online, cumulative, multiple choice assessments.

**Note:** if you have a course conflict with the tests or you are writing in a time zone that makes it challenging to write at that time, you will be given the opportunity to write at a different time. For students missing one test for a valid reason, the missed test mark will be calculated based on performance on the other three tests and class average of the other tests. For students missing two or more tests for valid reasons, the mark for the missing tests will be replaced by a cumulative oral assessment via Zoom.

## V COURSE POLICIES

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### E-mail

- For issues with **non-academic** problems, such as conflicts, illness and academic accommodations, please email Dr. Chulliparambil.
- For course content questions, please ask during your tutorial or during the online student hours or post your question on the course discussion board. **Please keep in mind that email is not the mechanism to receive explanations of course material.**
- For Practical-related concerns, please asking during your Practical session or during Practical office hours with Dr. Harewood, the Practical instructor.
- For other course concerns, please email Dr. Quinlan, the course coordinator.
- When you e-mail an individual in the teaching team, please include your full name and student number and identify yourself as a CHM135 student, making sure to use your UTORID

email address. Keep the language and tone of your email professional. Email only **one** member of the teaching team. 😊 We will forward the e-mail to the correct person if necessary.

- Most emails will receive a reply within 24 hours of being sent (except on weekends) but keep your expectations reasonable as to the degree of detail that an email reply to your enquiry can realistically provide.

### **Course environment**

- The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. U of T does not condone discrimination or harassment against any persons or communities.

### **Privacy policy**

- Parts of this course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session.
- Course videos and materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation and are protected by copyright. Do not download, copy, or share any course or student materials or videos without the explicit permission of the instructor.

### **Absences**

In order to receive consideration for the work missed for an illness or related reason, a completed University of Toronto Medical Certificate (at <http://www.illnessverification.utoronto.ca>) must be submitted to Dr. Chulliparambil, the Course Administrator within one week of the date of absence. Only serious illness (or equivalent reasons) will be accepted as justification for absence.

For absences due to cold or flu-like symptoms only, or due to COVID-19-related self-isolation requirements, you will need to instead record these absences through the Absence Declaration tool on [ACORN](#). The tool can be found in the ACORN Profile and Settings menu. You should record each day of your absence as soon as it begins, up until the day before you return to classes or other academic activities. The University will use this information to provide academic accommodation and to monitor overall absences.

Please note that the University is reviewing the absence policy and it is subject to change.

## **VI TECHNOLOGY REQUIREMENTS**

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Specific guidance from the U of T Vice-Provost, Students regarding student technology requirements is available here: <https://www.viceprovoststudents.utoronto.ca/covid-19/tech-requirements-online-learning/>

Advice for students more broadly regarding online learning is available here: <https://onlinelearning.utoronto.ca/getting-ready-for-online/>

This course requires the use of computers, and technical issues are possible. When working on an assignment, students are responsible for scheduling enough time to allow for reasonable delays due to technical difficulties to be overcome, so such issues will not be acceptable grounds for deadline extension. Particularly, maintaining an up-to-date independent backup copy of your work is strongly recommended to guard against e.g. hard-drive failures, corrupted files, lost computers, etc.)

## **VII INSTITUTIONAL POLICIES AND SUPPORT**

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### **ACADEMIC INTEGRITY**

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (<https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

In practical work:

1. Using someone else's ideas or words without appropriate acknowledgement.
2. Submitting your own work in more than one course without the permission of the instructor.
3. Making up sources or facts.
4. Obtaining or providing unauthorized assistance on any assignment.

On tests:

1. Using or possessing unauthorized aids.
2. Looking at someone else's answers or collaborating or discussing answers during an exam or a test.
3. Misrepresenting your identity.

In academic work:

1. Falsifying institutional documents or grades.
2. Falsifying or altering any documentation required by the University.
3. Sharing solutions to the online homework

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources (see <https://www.academicintegrity.utoronto.ca/>).

### **ACCESSIBILITY NEEDS**

Students with diverse needs are welcome in this course. The University of Toronto is committed to accessibility: if you require accommodations for a disability, or have any other accessibility concerns about the course, please contact [Accessibility Services](#) as soon as possible.