

Chem 020: General Chemistry 2007 – 2008 Course Outline

A course outline is a formal document that provides you with information pertaining to a course's dates, requirements, evaluation, and policies.

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Mandatory Notice from the Registrar

Unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

The prerequisite for Chemistry 020 is OAC or SCH4U Chemistry with a mark of 80% or higher.

Course Website: <http://instruct.uwo.ca/chemistry/020>

Students should check the website on a regular basis for news and updates. This website also contains links to the individual websites for the different sections, which are maintained by your instructors.

Lecture, Tutorial, and Lab Times and Locations

There are five lecture sections and six lab/tutorial sections, as listed below.

Abbreviations for the buildings can be found at <http://www.uwo.ca/westerndir/help/buildings.html>

Lecture Section	Lecture Time	Lecture Room	Lab/Tut Section	Lab/Tut Time	Tut Room
001	MW 2:30 – 3:30	SH 3345	007	Tu 9:30 – 12:30	SSC 2032
002	TuTh 9:30 – 10:30	MC 110	008	Tu 2:30 – 5:30	NS 7
			026	M 6:00 – 9:00 Group 1	NS 7
003	TuTh 11:30 – 12:30	SEB 2200	009	Tu 6:00 – 9:00	NS 7
004	MW 9:30 – 10:30	UCC McKellar	011	W 2:30 – 5:30	SSC 2032
			022	M 6:00 – 9:00 Group 2	NS 7
006	TuTh 2:30 – 3:30	SEB 2200	025	W 9:30 – 12:30	SSC 2032

All labs are held in the Chemistry Building, Rooms 10, 11, 12, and 13. These rooms are situated on the Ground Floor, which is one floor below the main floor. When entering the Chemistry Building from outside, take the doors near the Natural Sciences Centre and then take the stairs down one floor.

Course Instructors

Lecture Section	Term	Instructor	Office	Floor	Email
001	Fall	Dr. Ron Martin	ChB 23	Ground	rrhm@uwo.ca
	Winter	Dr. Felix Lee	PAB 224b	2 nd	flee32@uwo.ca
002	Fall	Dr. Phil Dean	ChB 123	Main	pawdean@uwo.ca
	Winter	Dr. Mark Workentin	ChB 223	2 nd	instrmsw@uwo.ca
003	Fall	Dr. Rob Lipson	ChB 1	Ground	rlipson@uwo.ca
	Winter	Dr. Mark Workentin	ChB 223	2 nd	instrmsw@uwo.ca
004	Fall	Dr. Ron Martin	ChB 23	Ground	rrhm@uwo.ca
	Winter	Dr. John Corrigan	ChB 16	Ground	jfcorrig@uwo.ca
006	Fall	Dr. Rob Lipson	ChB 1	Ground	rlipson@uwo.ca
	Winter	Dr. Felix Lee	PAB 224b	2 nd	flee32@uwo.ca

If you email your instructor, you must use your UWO email address and include *Chem 020-00x* in the subject line, where 00x is your lecture section. Messages from a non-UWO account or those that do not include *Chem 020* in the subject are automatically deleted, and you will not receive a reply.

Course Materials

Chemistry 020 Laboratory Manual, 2007 – 2008 edition. Old editions cannot be used. Please purchase the manual and bring it to with you to Lab Check-in.

Tutorial Practice Problems and Past Tests & Exams, 2007 – 2008 edition. Old editions cannot be used. Tests and exams from the last three years are included, but the order of lecture topics and lab experiments in the current offering of Chem 020 differs from those of the past years, and therefore, the order of topics in the past tests and exams are different from what is covered in class this year.

Safety Glasses are mandatory. You are encouraged to support other undergraduate students by purchasing your pair for just \$10 from the undergraduate Chem Club during Lab Check-in. These cost less and are preferable to those sold at the bookstore.

Approved, Button-Up Lab Coat, available from the bookstore or elsewhere. Designer lab coats, often sold as hospital scrubs, are not acceptable, as they are too short and/or do not offer sufficient protection to the upper body.

Molecular Model Kit, by Darling Models, from the bookstore. These come in bright-green boxes and will be used extensively in the second term of the course.

Sharp EL-510R(B) scientific calculator. At a reasonable price, it is the *only* calculator permitted in the labs and tutorials, and during tests and exams. All other calculator models will be prohibited. Students are responsible for bringing their calculators and for ensuring that they are in proper working order. The sharing or exchanging of calculators during tests or exams is strictly forbidden. Proctors for tests and exams do not lend calculators.

No textbook is required. Some may find a first-year textbook, such as *Chemistry: Principles and Reactions*, Masterton & Hurley, 5th edition, to be a useful reference. Copies are available in the library.

Evaluation

Components and Dates

The course grade, out of 100, will be calculated as listed below. Listed next to the respective components are their corresponding maximum values toward the course grade.

Component	Notes	Total Value
Term Test #1	Saturday, Nov. 3, 7:00 – 9:00 PM	10
December Exam	Scheduled by the Registrar, 3 hours	25
Term Test #2	Friday, Feb. 22, 7:00 – 9:00 PM <i>This is the Friday before Reading Week!</i>	15
Final Exam	Scheduled by the Registrar, 3 hours	30
Laboratory	Mandatory Lab Check-In	1
	Experiments	9
Tutorial	Quizzes	10

To pass the course, one must satisfy *all* of the following conditions:

- Perform at least 5 of the 9 laboratory experiments;
- Obtain a minimum of 4.50 out of 9.00 on the laboratory experiments;
- Obtain a passing mark (50%) on one of the December or Final Exams; and
- Obtain a minimum of 50 out of 100 in the whole course.

Since this is a laboratory course, you are expected to perform and complete all of your labs. All labs and tutorials count towards your overall course grade. No labs or tutorials are dropped.

It is Faculty of Science policy that a student who chooses to write a test or exam while ill is deemed medically fit enough to write and the student must accept the mark obtained. If you become ill during a test or exam, please contact your Dean's Office.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following website: <http://www.uwo.ca/univsec/handbook/appeals/scholoff.pdf>. Computer-marked multiple-choice tests and exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Aside from the specified calculator, no other electronic devices (phones, MP3 players, etc.) are permitted on your desk or person during tests and exams, even for timekeeping purposes.

Content of Tests and Exams

The content of the tests and exams will be based on what has been included in the lectures, the tutorials, and the laboratories *this year*, not by what was on the old tests and exams. Topics that are covered are indicated on the lecture-topic outline.

Due to the nature of chemistry, tests and exams are *cumulative*. That is, they will include *all* material covered since the first class, not just what has been covered since the last test or exam. However, the emphasis will be on the material covered since the last test or exam.

Missed Labs, Tutorials, Tests, and Exams

There are no make-up labs or tutorials. Students who miss an experiment or tutorial will be assigned a mark of zero for that experiment or quiz. The zero will be replaced with EXCU (excused) provided that the student 1) submits a *Missed Lab/Tutorial Application*, downloadable from the website, to course instructor, and 2) contacts the Dean's Office to have the reason for missing the lab or tutorial approved. A mark of EXCU shifts the weight of the missed experiment or tutorial towards the other experiments or tutorials.

There are no make-ups for the term tests or December exam. With proper documentation and approval, the value of the missed component will be shifted as follows:

- If Term Test #1 is missed, the value of the December Exam will be increased by 10.
- If the December exam is missed, the value of the Final Exam will be increased by 25.
- If Term test #2 is missed, the value of the Final exam will be increased by 15.
- Note that if more than one test/exam is missed, more than one of the above will apply. For example, if you miss both Term Test #1 and the December Exam, the value of the Final Exam will be increased by 35, so it will be worth 65.

Students who miss the Final Exam should contact their Dean's Office to seek approval for the Special Exam (SPC).

In accordance with Registrar guidelines, we will be pleased to support an SPC if you have three exams in 23 hours (three consecutive periods), *e.g.* 2 pm, 7 pm, followed by 9 am. We will not authorize SPC exams for those with three exams in four or more periods. If your exam occurs at the same date and time as another exam, the Registrar will make arrangements for you in designated conflict rooms.

Equal Opportunity and Evaluation Policy

Your instructors were, at one time, students themselves. Accordingly, they thoroughly understand the importance of course grades and the hard work that you will place into this course. They are here to help you succeed and achieve your desired grade.

Your instructors believe in academic integrity and will treat all the students equally. All students are evaluated equally based on the criteria presented in this course outline. Marks cannot be reweighed or adjusted on an individual basis except when requested by the Dean of Science.

Accordingly, we do not offer supplementary assignments, essays, tests, experiments, or other work of any sort as a means of increasing an individual's marks. After all, how would you feel if the person sitting next to you were provided with the opportunity to do an assignment for extra marks, and you weren't?

Outline of Lecture Topics

Term	Topic	Lectures	Covered on...		
Fall	Administration	1	Term Test #1	December Exam	Term Test #2
	Fundamental Concepts	4			
	Strong Acids and Bases	1			
	Oxidation and Reduction	2			
	Electronic Structure and Periodic Properties	4			
	Gases	4			
	Electrochemistry	4			
	Thermochemistry	4			
Winter	Lewis Structures, Shapes, and Hybridization	4	Final Exam		
	Organic Chemistry	6			
	Equilibrium and Weak Acids & Bases	4			
	Buffers and Solubility	4			
	Rates and Rate Laws	2			
	Mechanism and Reactivity	3			
	Fascinating Applications of Chemistry	2			

Cumulative tests and exams emphasize the material covered since the previous test/exam

Laboratory and Tutorial Schedule

On the week of September 17th, half the class will start with Lab Check-in in the lab, while the other half will start with a 1-hour review quiz, in the tutorial room, based on high-school chemistry. After about 90 minutes, the two groups will switch places. See the section on Lab Check-in for details. Note: those registered in 026 will automatically follow the Group 1 schedule, and those in 022, Group 2.

Simply follow the schedule below for subsequent weeks. **Please pay particular attention to the weeks shaded in blue.** Note: due to renovations to the Chemistry Building, the schedule for the last two weeks is subject to change, and any developments will be posted to the course website.

Week of...	Group 1	Group 2
Sept 17	Lab Check-in, then review quiz	Review quiz, then Lab Check-in
Sept 24	Tut: Stoichiometry 1 and 2	Lab: Synthesis
Oct 1	Lab: Synthesis	Tut: Stoichiometry 1 and 2
Oct 8	<i>Thanksgiving Week – No Labs or Tutorials</i>	
Oct 15	Tut: Strong Acid & Bases, Redox	Lab: Acid/Base
Oct 22	Lab: Acid/Base	Tut: Strong Acid & Bases, Redox
Oct 29	Tut: Atoms & Periodicity	Lab: Redox
Nov 5	Lab: Redox	Tut: Atoms & Periodicity
Nov 12	Tut: Gases	Lab: Molar Volume
Nov 19	Lab: Molar Volume	Tut: Gases
Nov 26	Tut: Electrochem (in tut room)	Tut: Electrochem (in lab)
Jan 7	Lab: Thermochemistry	Tut: Thermochemistry
Jan 14	Tut: Thermochemistry	Lab: Thermochemistry
Jan 21	Lab: Qualitative Analysis	Tut: Molecular Shape
Jan 28	Tut: Molecular Shape	Lab: Qualitative Analysis
Feb 4	Lab: Discovering Molecular Models	Tut: Organic Chemistry
Feb 11	Tut: Organic Chemistry	Lab: Discovering Molecular Models
Feb 18	<i>No Labs or Tutorials</i>	
Feb 25	<i>Reading Week – No Labs or Tutorials</i>	
Mar 3	Lab: Equilibrium	Tut: Equilibrium, Weak Acid Base
Mar 10	Tut: Equilibrium, Weak Acid Base	Lab: Equilibrium
Mar 17	Tut: Buffers and Solubility (in lab)	Tut: Buffers and Solubility (in tut room)
Mar 24	Tut: Rates and Rate Laws	Lab: Kinetics
Mar 31	Lab: Kinetics	Tut: Rates and Rate Laws

Laboratory Information

Check-in

All students must attend Lab Check-in, which takes place on the week of September 17. If you missed this for any reason, please contact your instructor for further instructions.

Instructors will divide lecture sections in half according to last name. The first half will proceed to the labs to perform Lab Check-in during the first 90 minutes of the three-hour period. During the last 90 minutes, the first group will write the review quiz. The second half will start with the review quiz, and after 90 minutes, proceed to Lab Check-in.

Be sure to have read the introductory section of your lab manual beforehand, and **bring the lab manual with you**. Also remember to bring your calculator! Go to the first year labs (rooms 10 – 13) on the Ground Floor in the Chemistry Building at the appropriate time. There, you will be placed into one of the four rooms and assigned a lab demonstrator.

At Lab Check-in, you will read, sign and hand in the waiver found in the lab manual. This waiver must be handed in or your name will not be on a class list. The demonstrator will show you the safety features of the lab; discuss preparation, marking, pre-lab exercises, and the dress code; show you how to use the balances; and briefly introduce significant figures.

You will practice significant figures and perform an enjoyable scavenger-hunt activity that will familiarize you with the lab. These activities count towards the Lab Check-in mark.

At the conclusion of the 90-minute period, you will know whether you are in Group 1 or 2, your lab room, and your demonstrator. *The group and room that you are assigned is permanent, and you must perform all labs according to the schedule for your group and in the assigned room.*

Safety and Dress Code

Western has strict safety regulations. Lab demonstrators and technical staff will eject students who, in their opinion, do not meet the safety requirements or are not prepared, as described below. **These students, or those who arrive after the start of the prelab talk, will receive a zero for the entire experiment, and no credit will be given for the pre-lab exercises.**

Eye Protection

Safety glasses or goggles must be worn by everyone whenever laboratory work is being performed. Students who wear prescription glasses must wear safety glasses or goggles over their regular glasses. Contact lenses are highly discouraged, but if you must wear them, you must inform the lab demonstrator that you are wearing contact lenses.

Should you forget your safety glasses, they may be rented for \$2.00 per lab period. Don't forget that the Chemistry Club sells them for \$10 during Lab Check-in.

Lab Coat, Pants, Socks, and Footwear

Approved lab coats must be worn, buttoned up. Students must arrive with a lab coat and cannot leave to obtain one after the pre-lab talk. **Lab coats are not provided by lab demonstrators and are not available for rent.**

Students must wear ankle-length pants, socks, and shoes that are close-toed and completely cover the upper foot to the ankle. This means (and is not limited to): no skirts, no shorts, and no sandals. If in doubt, ask. **We do not rent socks, shoes, or pants.**

Preparedness

Pre-lab exercises must be completed before the lab period and handed in when you arrive at your lab, before the pre-lab talk starts. These are designed so that you must read the experimental strategy and procedure to complete the exercise.

Read each experiment carefully; check the data sheets to find out where to record your numbers; and set up calculations on the work sheets, if possible. Get organized with your partner and determine who will do which tasks. Each experiment will also refer you to the *Tools of Chemistry* section of the manual, which you must also read.

Tutorial Information

Chem 020 tutorials provide an informal environment where you can make friends, talk to your instructor, and most importantly, ask chemistry questions. Tutorials help you prepare for tests and exams by encouraging you to learn the material and stay up-to-date. You should have attempted the practice problems for the indicated topic prior to arriving at the tutorial.

The first two hours of each three-hour tutorial period will be spent working on problems, with the help of teaching assistants and, on some occasions, your instructor. In the third hour, a quiz will be written. Although the quizzes count only towards 10% of your course grade, the time invested in the tutorials pays big dividends at exam time, and this 10% could make a difference between a pass and a fail.

Chemistry Help Room

If you require assistance in the course, the Chemistry Department runs a Help Room that is supervised by course instructors or staff. There is no cost (included with tuition), and the setting is very informal. Simply drop in to ask questions. Times and locations will be available on the course website.

10 Hints for Success in Chemistry 020

1. Attend class regularly. (Always!)
2. Be prepared to work regularly outside of class time... this is university!
3. Read over your notes after each class. Don't fall behind in reviewing and understanding lecture material.
4. Read the section *How to obtain maximum benefit* in the tutorial manual.
5. Prepare for each tutorial in advance by attempting as many practice problems as possible.
6. Prepare for each laboratory class in advance by reading the lab manual and doing the pre-lab exercise. Pay attention during the pre-lab lecture.
7. Make regular use of the Help Room.
8. Start studying for tests and exams well in advance. Don't rely on last-minute cramming.
9. Avoid using old tests and exams to learn course material for the first time. They are better suited as evaluation tools. Study from lecture notes and do the tutorial problems first. Once you feel that you know the material, use the old tests and exams to test your knowledge. There are some courses where you could do well just from doing the old tests and exams, and Chemistry is not one of them!
10. When writing test and exams, read the question carefully, both before and after answering it.
11. Attend class regularly!

Future Course Selection

Below are some suggestions regarding course selection in second year. It may seem early to be thinking about this, but it pays to plan ahead. Many courses have prerequisites. Before, and at, Intent to Register time in February 2008, the Chemistry Department (and others) will provide you with lots of help and advice! However, Senate regulations require that we advise you:

Unless you have either the pre-requisites for a course or written special permission from your Dean to enroll in it, you may be removed from the course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

During the first two weeks of the term, you have the opportunity to add, drop, or change courses. Now is the time to make sure that you have the correct course selection for whatever program with wish to take on 2nd-year. Since most students are unsure of what they wish to take, it is best to choose courses that maximize the number of possible options.

Should I take Chem 020 or 023?

Chemistry 020 is for students who received 80% or higher in OAC or SCH4U Chemistry, or equivalent. Students with marks under 80% are encouraged to take Chemistry 023.

Either course will serve as a prerequisite for any Chemistry program, but a switch must be made during the add/drop period in September. The switch can be done yourself before the end of web registration (Sept. 8), or you can visit the Chemistry “paper add/drop” desk between Sept. 10 – 15. Hours for paper add/drop will be posted by the Faculty of Science. Permission to transfer to Chemistry 023 will not be given to students having OAC or SCH4U of 80% or higher.

Year 1 Math

A full course in the mathematical area must be completed in Year 1 for entry to many Science modules, including Specializations, Majors, and Minors in Applied Math; Specializations, Majors, and most Minors in Physics and Astronomy; and Specializations and some Minors in Earth Sciences.

For Specializations, Major, and Minor involving Chemistry, this requirement may be met by 1.0 course from Calculus 050a/b plus 0.5 course from Calculus 051a/b or 081a/b or 091a/b, Linear Algebra 040a/b; or by Applied Math 026; or by Math 030 (with appropriate marks). See Academic Calendar for details.

Year 1 Physics

1.0 course in Physics from Physics 020, 024, or 028a/b and 029a/b is required for entry to the Major and Specializations in Chemistry. For the mark requirements, you should again consult the Calendar.

If you have not taken Physics in Year 1 you may, with special permission, proceed in your second year into the Major or a Specialization involving Chemistry, but you will have to make up this deficiency, normally in your second year. Note: this will complicate your second-year timetable!

Year 1 Biology

Biology 022/023 is required for Year 2 Biochemistry/Chemistry, Biology, Chemistry/Environmental Science, and Medical Science, and it is required or strongly recommended for all other Environmental Science modules.

Answers to Frequently Asked Questions

How can I make up a missed lab, tutorial, test, or exam?

The course outline is a very useful resource that contains course policies... please see page 5.

I missed a lab/tutorial/test/exam because I overslept, I missed the bus, I couldn't find the right room, traffic was heavy, my hamster died, I had a date, or I had tickets for a show. What should I do?

There is nothing you can do, and you will have to accept the consequences.

I missed a lab/tutorial/test/exam because my flight was delayed or cancelled, or I got bumped.

If your flight was delayed or cancelled, or you got bumped, due to circumstances beyond your control, please discuss it with your instructor. However, if you got bumped because you were knowingly flying stand-by, you were therefore aware of the potential outcome, so you will receive a zero.

I was feeling unwell when I wrote the exam, so I did poorly. What should I do?

If you wrote the exam, you have deemed yourself fit and it is too late to do anything after the fact. If you are genuinely unwell, do not write the exam. Pick up a medical note from a physician and take it to your Dean's Office. If you miss the final, you must apply for a special exam through your Dean's Office.

My high school commencement falls on the same day as the first midterm in November. Can I write the exam early? Can I write it after I get back?

No. Commencement is not a university-endorsed event. However, your instructor will give you the option of missing the test and shifting its value to the December exam. There are no make-up tests, and the Term Test #1 is usually the test that has the highest class average. It is a decision that you'll have to make. We will have a form for download on the website, should you wish to attend commencement.

I have a lab/tutorial which coincides with a religious observance. What should I do?

Most of the standard religious observances are already noted in the Western Multi-Faith Calendar (<http://www.uwo.ca/equity/docs/mfcalendar.htm>), and you should inform your instructor as soon as possible. If you are requesting accommodation that is not on this list, please bring documentation.

What should I do if a midterm or make-up exam for another course conflicts with my lab/tutorial?

In all cases, a regularly scheduled class (be it a lecture, lab, or tutorial) takes precedence over events such as make-up exams. You must ask the instructor of the other course to accommodate you.

I am leaving on a trip the Friday night before reading week in February. The trip is non-refundable and cannot be changed. Can I shift the weight of Term Test #2 onto the Final Exam?

This course outline is a formal document that provides you with notice pertaining to a course's dates, requirements, evaluation, and policies. If you can provide ample proof that the trip was booked prior to September 15, 2007, yes, we can shift the weight. Otherwise, you will have to accept the consequences. According to the Academic Calendar, Reading Week does not officially start until Monday, February 25.

Can I use an alternate calculator? My dog ate my Sharp EL-510R, and the alternate one is just another simple, cheap calculator.

No. The strict calculator policy was introduced to combat a growing trend to bring high-powered calculators, or even hand-held computers, to tests and exams. Some of these devices are capable of storing a lot of information. A strict calculator policy, using a cheap-but-adequate calculator was the fairest way to ensure that no student gets an unfair advantage. This policy will be applied firmly.

Do the marks ever get curved, belled, or scaled?

No.

I prefer to use my non-UWO email account (Gmail, Hotmail, Yahoo, Rogers, etc.). Can you please send email to this address?

No. We will only use your UWO email account for security reasons, and it is used throughout the university by your Faculty, the Registrar, etc. for official communications.

How can I contact my TA for extra help?

TAs are graduate students that work under the Graduate TA Union contract, which governs the maximum number of hours that they can be employed as TAs. While they are neither paid nor obligated to help you outside of lab/tutorial hours, many of them are delighted to help as much as they can, and you can ask them for their email addresses. Don't forget that there is also the Help Room, your instructor, the tutorials, and various study groups that are organized in residence!

So how about a private tutor?

You are most certainly welcome to pay for any third-party review or tutor services, but realize that they are not affiliated with nor endorsed by the university. As such, the university cannot be responsible for any of the content they provide, even if the content causes you to answer exam questions incorrectly. The Chem Club maintains a list of private tutors, but we do not scrutinize, grade, or assess the suitability of these individuals as tutors.

Students should realize that they cannot hire tutors who are also Chem 020/023 demonstrators or teaching assistants, even if they are not from your own lab or tutorial section. This is a serious legal matter pertaining to conflict of interest. If you are ever in doubt, please do not hesitate to ask.