Changes to Chemistry Degree Programs

as of Fall term 2009

Who is affected?

- Students transferring into a Chemistry program as of Fall 2009.
- New students enrolling in a Chemistry program as of Fall 2009.

What has changed?

All programs:

- CHEM 2010 is no longer required. The material is shifting to CHEM 2030 and CHEM 3010 in stages over two years, and CHEM 2010 will be retired.
- CHEM 3000 and 3001 are new 3-credit lab courses to replace the laboratory components of CHEM 3010, 3011, 3020, 3021, 3030 and 3031, which become 3-credit courses. Both CHEM 3000 and 3001 are required for all programs except the Double Majors programs and the 90-credit BSc. Only CHEM 3000 is required in Double Majors programs, and both are electives in the 90-credit BSc.
- The 3000- and 4000-level requirements in most programs have been simplified.
- There are minor changes to the credit counts in some programs.
- The prerequisites and course descriptions of some courses have changed, and may affect course sequencing. See the website for details on those changes.

Specialized Honours programs only:

- The minimum gpa requirement is increasing from 5.0 to 5.5 overall.
- Except for the Pharmaceutical & Biological stream, CHEM 3010 is required and CHEM 3011 is optional. In the Pharmaceutical & Biological stream, CHEM 3011 remains required.

Honours Major program only:

- CHEM 4000 is now an elective, subject to availability, but cannot serve to satisfy the 4000-level requirement.

Honours Double Major programs only:

- With CHEM 2010 being phased out, there is no longer an option among 2000-level courses.

With courses being changed, will you still be able to finish your program?

Yes. CHEM 2010 and the 4-credit versions of CHEM 3010, 3011, 3020, 3021, 3030 and 3031 will continue to be offered long enough for everyone needing these courses to take them.

Can you follow the new requirements if you joined your program before Fall 2009?

That depends.
In principle, every student has the option of graduating by fulfilling the requirements in place when

they joined their program or those in place when they graduate, if it is to their advantage. However, it may be impractical or impossible for a current student to follow the new requirements.

If you are in a 90-credit Bachelor program:
The only change concerns CHEM 2010, which is no longer required. You may switch to the new requirements if you want to avoid having to take CHEM 2010. While following either set of requirements, you can fulfill the 3000/4000-level requirement with any of the new 3-credit courses except CHEM 3000 and 3001. There is no requirement in the 90-credit Bachelor program to take any 3000-level lab courses, but if you want lab experience, you must take one of the 4-credit courses while they are still available (all but CHEM 3080 will be phased out by 2011-12), but you now have a greater selection of 3-credit courses with which to fulfill the rest of the 3000/4000-level requirement.

In all other programs:
- If you have not already taken any 4-credit 3000-level course other than CHEM 3080, then do so as soon as possible. They will continue to be offered for some time so that you can fulfill your existing requirements. Indeed, following the new requirements and taking CHEM 3000 and 3001 will not be fully possible before 2011-12.
- If you have already taken even one 4-credit 3000-level course other than CHEM 3080, you would not be eligible to take CHEM 3000 or 3001 in any event, since they have *course credit exclusions* with the existing 4-credit courses. No one is allowed to be credited for two different courses that cover the same material, and CHEM 3000 and 3001 overlap with the lab components of the 4-credit courses.

Why can I not take CHEM 3000 and 3001 until 2011-12? Why are they listed now?

The full implementation of these courses will only occur gradually and they will not become full-fledged courses until they are needed in 2011-12 for students entering in Fall 2009. They have been created and listed now for two reasons, one administrative and one practical.

Changes to degree requirements can only be imposed upon new students, not students already engaged in the affected program, as they must be able to complete the program that they joined. Existing students can opt to follow a new set of requirements if they find it advantageous (but they cannot mix requirements from old and new programs). Hence, the changes to the 3rd-year lab experience will be imposed only on students entering in Fall 2009, and their 3rd-year lab experience will occur no sooner than 2011-12. However, no program can require courses that do not exist, so the new CHEM 3000 and 3001 need to exist in Fall 2009, even if not open for enrolment.

However, a few students transfer from other programs or from other universities into the 2nd or 3rd years of Chemistry programs. Those doing so as of Fall 2009 need to follow the new requirements, since those are the requirements that will be in effect when they transfer. So they will need CHEM 3000 and 3001. These new courses are intended to collect the lab portions of three 4-credit courses running in each term (CHEM 3011, 3020 and 3030 in the Fall, CHEM 3010, 3021 and 3031 in the Winter) into single courses, yet the 4-credit courses will need to continue to be offered at the same time until no one currently in the programs will need them. There will therefore necessarily be a transition in the delivery of the 3rd-year lab experience that allows current students to do experiments in, say, only Physical Chemistry within CHEM 3011 4.0 but also allows transferring students to do experiments in all three areas (Physical, Organic, Inorganic) in CHEM 3000 3.0. The plan for 2009-10

is to individually assign transferring students to individual experiments in each of the three 4-credit courses running, which will cause some scheduling headaches.

In short, to allow us to transition between the existing set of 4-credit lecture+lab courses to the new set of 3-credit lab-only courses, while at the same time allowing transferring students to take the latter and continuing students to take the former, practicality forces us to restrict access to CHEM 3000 and 3001 to new and transferring students only, for the time being.

Why are we making these changes?

There are several motivations behind the changes coming into effect in Fall 2009.

- The changes to CHEM 2010, 2030, 3010 and 4010 are part of a reorganization of the teaching of theoretical chemistry, driven by pedagogical concerns. Since CHEM 2010 has been a required course for most of our programs, these programs needed to be adapted to those changes.
- The increase in the minimum gpa requirement for the Specialized Honours degrees is driven by the desire to improve the preparation of graduates of accredited degrees for their post-graduate futures.
- The introduction of CHEM 3000 and 3001 as mandatory courses for most Honours degrees, in replacement of the existing requirements for 4-credit courses, has several motivations:
  - to increase graduates' total laboratory experience without burdening students with more theoretical (lecture) requirements
  - to offer a wider selection of 3-credit lecture courses without burdening students with more labs
  - to improve the laboratory experience of students by dissociating it from lecture courses that may or may not be well connected to the laboratory exercises
  - to separately assess laboratory performance and theory (lecture-only) performance
  - to allow students to separately schedule their lecture and laboratory courses according to their needs
  - to ease the administrative burden of issuing lab exemptions for those repeating CHEM 3010, 3011, 3020, 3021, 3030 or 3031, and thereby be rid of lab 99 sections
  - to lower by 25% the tuition paid by students repeating CHEM 3010, 3011, 3020, 3021, 3030 or 3031
  - to facilitate the achievement of university- and Faculty-mandated credit totals (which are multiples of 3) by replacing 4-credit courses with 3-credit ones
  - to improve the learning outcomes of the laboratory exercises in order to better prepare students for post-graduate careers, in particular to improve the effectiveness and level of professionalism that students achieve in the laboratory and in their communications, which can best be achieved in consolidated lab courses that assess the students' ability to meet those objectives without dilution by assessments of their knowledge of theory
  - to better prepare Specialized Honours students for CHEM 4000
  - to better meet the needs of Specialized Honours degree accreditation, which requires more of the structured lab experience (that in the 3rd year) and less reliance on un-structured experience (CHEM 4000); to nevertheless still foster transferability between programs, the requirements for the other Honours programs need to be adjusted as well