

Going the distance in Canada

Athabasca University sets the pace out West in its approach to distance learning chemistry.

ATHABASCA UNIVERSITY (AU) is located in the town of Athabasca, Alberta. In addition to the main facility in Athabasca, AU also has 'learning centres' in Edmonton, Calgary and Fort McMurray – three of the larger urban centres in Alberta – as well as a network of 'examination centres' throughout the province (see Fig 1). Although based and funded in the province of Alberta, AU is modelled on the Open University (OU) in the UK^{1,2} and is devoted to increasing the accessibility of university-level education to all Canadians. With *ca* 14 000 students, AU has *ca* one tenth of the undergraduate population of the OU.³ AU courses are mainly home-study with telephone tutor support, and formal entry-level requirements are kept to a minimum. However, unlike the OU, AU has a year-round registration policy which enables students to begin a course on the first day of any month.

The chemistry course

While AU does not offer a degree in chemistry, chemistry courses form part of the general BSc. There are two introductory chemistry courses (first year), two organic chemistry courses (second year), an environmental chemistry course (second year), and an introductory biochemistry course (third year). The theory component of these courses is print-based, with 'telephone-tutor' support. When students register on a course they receive a 'course package' which includes all the instructional materials – *eg* textbooks, study manuals *etc* – that are needed for the theory component, and instructions on the various administrative procedures. The theory components of AU chemistry courses all have supportive study guides to accompany the text, providing maximum support to the students. With the exception of a few foreign language courses, all AU courses are written in English. To ensure that our course materials are of the highest quality, they have been developed by a team which includes a course manager, author(s), a subject matter expert, an editor, a visual designer, and an instructional designer.⁴⁻⁶

Students are allowed a six- or 12-month contract period to complete a course at their own pace, during which they must hand in assignments and do laboratory work. They take mid-term and final examinations when they are ready. The examinations are 'closed book' and are taken at one of the university's examination centres where they are invigilated.

Each student has a 'telephone tutor' whom he or she may call (toll free) at certain specified times – usually one evening per week. Chemistry tutors usually have a group of 32 students on a given course. This one-to-one tutor-student interaction can be an important factor in motivating students to complete a course. With year-round enrolment, a tutor will have students who are at various stages of the course. Telephone tutors also have several other duties, including marking assignments and laboratory reports, scheduling students into available laboratory sessions *etc*. Most AU tutors are employed on a part-time basis, and

many concurrently hold academic positions with other tertiary institutions. Unlike tutors in many other disciplines, chemistry tutors often meet their students during laboratory sessions.

Role of laboratories

A good laboratory component is essential to the overall success of any first- or second-year university chemistry course. Many of our students register on these courses with the intention of transferring the credits obtained to other institutions. Since AU chemistry courses have creditable laboratory components, they can be readily transferred to other universities or colleges.⁷ Other institutions in Canada that offer distance learning chemistry courses with no laboratory component do not receive recognition or credit for their courses at the university level.

The cost of delivering laboratory courses has become a major concern for many, if not all, college and university chemistry departments.⁸ In addition, the 'distance teacher' faces major problems in trying to synchronise laboratory activities with the material presented in the theory component of the course – a problem which is intensified at AU because of the institution's policy of allowing year-round registration. The fact that the locations at which AU offers its laboratory sessions are separated by large distances merely compounds these problems. The difficulties in providing students with adequate laboratory experience is probably the main reason why some universities do not offer distance learning science courses.⁹

In addition to reinforcing one or more of the concepts covered in the theory component of the course, each experiment should stimulate the students' interest and maximise their learning experience. The tutor must also be able to deliver the experiments in a timely and effective manner. At AU, a one-semester course requires the student to do a total of 32 hours of laboratory work. A student attending a traditional North American university does approximately the same amount of laboratory work in 10 weekly three-hour sessions.

Fig 1 Location of Athabasca University in Canada.



