

First Year Experience Office

6

**Nominations received
for exemplary
Engineering faculty
members**



Engineering

Congratulations to [Dr. Bryan Hollebone, the Engineering Featured Faculty member for 2006.](#)

[Engineering Featured Faculty Member for 2006](#)

[Other Nominations](#)

Dr. Bryan Hollebone
Department of Chemistry

Educational History

1963 B Sc Honors in Chemistry, Carleton University

1967 Ph.D. in Inorganic Chemistry, University College, University of London, England

Courses Taught This Year

CHEM 1101B F - Chemistry for Engineers

BIOC 4708 / CHEM 5708 F - Principles of Toxicology

CHEM 4305 W Advanced Inorganic Chemistry

Directions of Research

Dr. Hollebone has been involved in projects in both the public and private sectors which have influenced both his teaching and research.



Starting from synthetic inorganic chemistry, the need to understand structure and reaction processes required measurement of physical properties, especially photonic spectra.

The results of this were applied in three related directions of research and teaching;

Formulation of revised molecular theory: for recognizing the meaning of spectra. This has lead to simplified effective models for predicting the possible existence and behaviour of new substances.

Design and building of new types of spectrometers: to detect new kinds of data, especially Magnetic Circular Dichroism. This has lead to the ability to detect previously invisible data and to the ability to analyze chemical substances at part per trillion levels. The materials and devices needed to do this have been patented and now form the basis of a new commercial enterprise.

Bioinorganic chemistry: especially the structure and reactivity of heme proteins in the liver and their role in preventing or promoting intoxication and disease. This has lead to a new model for predicting the incidence of disease, based on the molecular structure of a polluting substance.

Other Teaching Interests

These research directions have directly influenced the type and content of courses.

▶ Inorganic;

Introductory courses: based on the insight into the most prominent patterns of structure and behaviour which inter-relate all the elements in the periodic table. These patterns eliminate the need to know many isolated details but provide the basis for memorable trends in chemical structure and reactivity.

Advance inorganic courses: based on using periodic trends to interpret complex physical information and to provide a context for prediction and validation of chemical hypotheses.

▶ Spectroscopic;

Molecular Spectroscopy courses: showing how to use the symmetry of molecules to the best advantage in translating spectroscopic information into a precise description of molecular structures; also showing the use of this information in designing reactions of molecules with light to produce predictable new compounds.

▶ Toxicologic;

Undergraduate and graduate Toxicology courses: starting with the fundamental WHO concept of "Risk", these courses define the exposure and intoxication mechanisms which lead to disease initiation at the biochemical level. Techniques for recognizing toxic materials and the disruption of healthy organisms which they cause are discussed.

The development of these and related courses by many faculty members at Carleton and the University of Ottawa has been formalized into a unique, official Specialization in Toxicology available now at both M Sc and Ph D levels for degrees in Biology, Chemistry and Earth Science at both campuses.

Professor Hollebhone on his teaching philosophy

Learning in context: In my experience, students at all levels start any course wanting to know why the subject is relevant to them and to the larger world. By showing the historical origins of a science, the reasons for its rules and content can be made clear. Then it becomes possible to predict the inevitable development of this science into the basis of the technologies needed by society.

Learning as pattern recognition: Once the purpose of learning is established, the form of learning becomes abstraction of facts into patterns of knowledge. This not only organizes forgettable facts into memorable formats, it shows that validation of these patterns from initial hypotheses to final Laws of Nature then provides a basis for defining how our "reality" is perceived.

Web accessibility: It is now routinely possible to supplement or even replace standard texts with information and exercises relevant to course philosophy and content. As in the ITV system, a prepared set of notes and scheduled reviews allows students to study in their own time and, using email, to satisfy specific questions. In my experience of over a decade, this form of interaction with students has essentially eliminated any demand for office hours.

Noteworthy student Comments

"[His] course is the only course I've actually looked forward to attending, definitely since coming to Carleton, maybe even ever."

"I feel that the other sections that did not have Dr. Hollebhone as a professor missed vital skills that may hinder their work after they enter the work force."

"The fact that I hated chemistry with the fiery passion of a burning sun in high school should give some idea of how Dr. Hollebhone's teachings methods have influenced me."

Carleton University would like to thank and recognize all Engineering faculty members who have been nominated by their students.

Other Nominations:

Faculty	Department
Gu, Junjie	Mechanical and Aerospace Engineering
Isgor, O. Burkan	Civil and Environmental Engineering
Nakhla, Michael	Electronics
Nicholson, Ross	School of Industrial Design
Russell, Donald	Mechanical and Aerospace Engineering

Noteworthy student Comments

"Professor Russell cares and listens to his students, goes out of his way to help them, whether it's rehearsing for a presentation or discussing a concern in his office, he is friendly, pleasant, and human about his approach to students."

"Professor Gu is never frowning and always happy to see his students. He will cancel whatever is at hand to take your question."

"I look forward to Professor Ross' classes because I can sense he genuinely wants to teach his students and give them as much as he can."

"Everything Professor Isgor does is to help students succeed. Not just to get good marks, but to really understand the material."

"Professor Nakhla always said the objective of the course was for us to learn and he actually made us feel that way."