

## An engineering school's farming roots

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**I**n Ontario in the 1860s, farming had little to do with science. Farmers faced such devastating problems as insect plagues, and crop and animal diseases without technical solutions. At the time, however, many believed farming was an “art” that couldn't be learned from books.

The Ontario School of Agriculture was established in 1874. Despite some initial resistance, farming and science became linked, with the aim of taking the “chance” out of farming. The school's mandate was to “teach the pupils how to perform farm work in the best manner and to give them, in the class, the scientific instruction necessary to their thorough understanding of the scientific facts and principles on which such operations are based.”

To that end, the students built and repaired farm implements and buildings, and studied land reclamation, roads and land surveying.

In 1875, William Brown, a recipient of an honorary “civil engineer” designation from the University of Toronto, was appointed farm superintendent—a position he held for 13 years. In 1880, the Ontario legislature created Ontario Agricultural College to replace

**The second oldest in Canada, the University of Guelph's engineering school has its roots in Ontario Agricultural College, which celebrates its 125th anniversary this year. Here's a look at how the school's history has been shaped by the marriage of agriculture with science.**

the School of Agriculture. Professor Brown taught the first full-year course in agriculture, and the college was soon off and running with an ambitious curriculum, including building layout, statics, dynamics, hydrostatics, drainage, surveying, meteorology and road-making. By the turn of the century, four different programs were offered: a two-year diploma providing training in farm work, a three-year specialist certificate, a four-year bachelor of science and a series of short and long courses.

The college maintained high standards of education, while focusing on two areas: research and teaching. Over the years, such innovations as disease-free strains of vegetables, the use of predator insects to devour plant parasites, the first pedigree Aberdeen Angus calf, lean bacon hogs and milk cows bred to be big producers were all developed at the college. As for teaching, the college turned out a continuous stream of veterinarians; teachers; fruit, dairy and meat inspectors; commercial field sales people; and farmers.

In 1901, Sir William C. Macdonald of Montreal donated \$175,000 toward the creation of the Department of Domestic Science, Nature Study and Manual Training, which would train teachers to be



Ontario Agricultural College's Department of Animal and Poultry Science is the home of modern animal agriculture research and teaching at the University of Guelph. It offers undergraduate degrees in animal science and animal biology.

instructors in manual training and emphasize the education of women. Construction of additional building space began in 1905 to accommodate the new department.

### The genesis of engineering education

The manual training program was discontinued in 1921 in favour of the Farm Mechanics Department, which taught drawing, woodworking, the principles of gasoline engines and tractors, elementary building construction and concrete. Although the new program was short-lived, it is generally acknowledged that the farm power short courses were the precursors of Guelph's agricultural engineering program.

Other developments that helped build the foundation for agricultural engineering education included the creation of a physics department and the introduction of calculus courses. By 1906, the physics program included such topics as arithmetic, hydrostatics, mechanics, climatology and advanced soil physics.

In 1928, the Physics and Farm Mechanics departments were amalgamated to create the Agricultural Engineering Department, to enable the integration of teaching and research that Ontario farmers were calling for. Enrolments in the program rose steadily, making it possible to add several advanced courses in farm power and machinery—both of which had become essential in taking crops from seed to harvest, and farm animals from birth to market.

Education in the department came to a halt during the Second World War, when the entire student body was enrolled in military training, and the Department of National Defence annexed several buildings for military use.

### Post-war boom

Agricultural engineering research resumed immediately after the war, to further advancements in such areas as machine design, dairy barn ventilation, septic tanks, snow plows, paints and tillage. There was also increased emphasis on mechanized farm machinery, as the industry sought ways to lower costs and increase yields.

Meanwhile the college's degree programs continued to expand. The first bachelor of science in agriculture degree was award-

ed in 1948. Shortly thereafter, in 1950, the first student graduated with a master's of agricultural engineering.

In 1957, the agricultural engineering department changed its name to the Department of Engineering Science, to reflect its new, broader focus. A new civil engineering option was added, as well as courses in municipal planning and administration, transportation, concrete, soil mechanics, highway and sanitary engineering.

### Becoming a university

The various colleges at Guelph were federated in 1961, an intermediary step toward formation of a university. The University of Guelph was finally created in 1964, and its senate approved bachelor of science in engineering degrees in the disciplines of mechanical and power, structural and water resources. Engineering graduate programs were also created at the masters and doctorate levels.

In 1969, the university's engineering programs were revamped to fill the need for a liberal engineering education in the agricultural and environmental fields. The new major areas of specialization became agricultural, biological and water resources engineering. These three programs formed the cornerstone for the current engineering degrees offered by Guelph.

The Department of Engineering Science was renamed the School of Engineering in 1970. Construction soon began on a new building for the school, which was named after Albert A. Thornbrough, who was then president of Massey-Ferguson Ltd., which had donated \$750,000 toward construction. In 1973, Guelph's three undergraduate engineering degree programs were accredited, the same year the first students graduated from these programs.

### Engineering education today

During the 1980s, the core content of Guelph's engineering programs was reorganized twice to keep up with changing education needs—and that was just the beginning. A co-op program was added in 1984. Continued emphasis was placed on research—particularly of an interdisciplinary nature. In addition to agricultural, water resources and biological engineering, minors appeared in food and



The University of Guelph's biological engineering program gets students ready for work in the pharmaceutical, chemical and food processing industries, as well as for biomedical research.

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environmental engineering. The food and environmental engineering programs became majors in 1991.

In the early 1990s, the rapidly growing computer and environmental engineering fields began to form the focus of the School of Engineering. As a consequence, the agricultural engineering program was eliminated in 1993. The program had formally existed for over 60 years.

The late 1990s have seen another period of radical change. Under the guidance of the school's director, Dr. Lambert Otten, P.Eng., the undergraduate program will be expanded from about 600 students to 1000, with the majority in engineering systems and computing programs. Plans also call for upwards of 100 graduate students, most of whom will be enrolled in the same programs. Expected to be completed by 2001, an extension of the Albert A. Thornbrough building will almost double the size of the school. Finally, the number of engineering faculty will increase from 18 to 30 over the next three years.

In the years to come, engineering education at Guelph will continue to improve on standards set before the turn of the century, while growing in response to the rising demand for engineers in each of the school's primary disciplines of engineering systems and computing, environmental, biological, food and water resources engineering. ◆

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