



QUANSER
INNOVATE. EDUCATE.

QUEEN'S UNIVERSITY: How to save funds, space and time while expanding your engineering program.

By 2003, the Faculty of Applied Science at Queen's University (Kingston, Ontario, Canada) was facing the same kinds of growth and space challenges that are familiar to engineering schools around the world. With a diverse range of 10 unique engineering programs - and limited facilities - the staff at Queen's created a co-operative, state-of-the-art space that serves all engineering disciplines.

A SPACE FOR CREATIVE AND COLLABORATIVE LEARNING

The result, which opened in May 2004, was the multi-use Integrated Learning Centre (ILC) housed in Beamish-Munro Hall - an 80,000-square-foot three-story building, arranged around a central atrium - with a purpose to provide support for creative and collaborative learning.

"The idea was to have a building dedicated to undergraduate teaching and available just for students," says Dr. Keyvan Hashtrudi-Zaad, Assistant Professor, Department of Electrical and Computer Engineering. "The students run experiments, they can have project meetings, there is specialized teaching going on in the building ... it all works extremely well."

Keyvan explains the lab space in these "instrumented classrooms" is reconfigurable, in that different disciplines share movable



Viewing the vibration performance of the Quanser's Flexible Link experiment.

carts, which are equipped with various computers and common measurement tools.

"Within five minutes, you can bring all the carts out, plug them in and use them," Keyvan adds. "The minute the lab is over, the carts are put into storage. So it's completely reconfigurable and it's a very efficient use of space."

He notes "good communication and planning" between the various departments allows the lab to run smoothly.

DEPARTMENTS FIND VALUE IN SHARING EQUIPMENT

When Quanser visited Queen's, a robotics lab was in session, run by the Electrical Engineering program. The course was "Introduction To Robotics" and 20 fourth-year students were actively learning and experimenting with Quanser's Rotary Flexible Link and Rotary Flexible Joint, as part of the controls portion of the course.

"While this particular lab is for Electrical and Computer Engineering, we share Quanser equipment with other departments," says Keyvan. "Our department, Mechanical Engineering, Chemical Engineering and the Mathematics and Engineering program - all have control courses."

Shared by 10 engineering programs, the Integrated Learning Centre, Queen's University, Canada



So the entire faculty is not just sharing space, it is sharing equipment.

"Yes, that's the whole idea of going with Quanser equipment," Keyvan explains. "We decided to go with Quanser because Quanser equipment was modular and flexible, you can use it for control, you can use it for robotics, and you can add different accessories to each servo module and create new experiments out of it."

EXCELLENT SUPPORT

"While the modularity aspect of the equipment is unique - a feature that dramatically reduces the cost-per-experiment (since many experiments can be conducted on the same "base unit") - Keyvan also cites the Quanser curriculum as a benefit to professors and students alike. In addition, he notes the experiments are easy to use, install and operate.



Dr. Keyvan Hashtrudi-Zaad, a satisfied user of Quanser-equipped centre

"But," he stresses, "the real surprise to us was the excellent technical support and service. This is something we found out about later - that it was really good. Nothing has gone wrong with the equipment, but in terms of people asking questions, the Quanser service is quite remarkable."

And while the Queen's professor was impressed with Quanser's complete understanding of control education and research, he saved his final words for a simple, straightforward observation:

"We've found that the equipment is of very good quality ... we simply haven't had any problems with it!"



During a robotics lab, a Queen's University student is running Quanser Flexible Joint experiment.

Queen's University Integrated Learning Centre

was opened in 2004. This unique facility is designed to support new and exciting initiatives in undergraduate engineering. Queen's ILC seeks to provide students with the skills and attitudes which they need to elevate theory to practice and encourages active learning with the aim of increasing the depth of learning, the retention of understanding and the development of learning skills. It also helps students to understand the role of engineering disciplines and the role of professionals outside of engineering. To learn more, visit <http://ilc.queensu.ca>.

Quanser's SRV02 series

of servo plants is ideally suited to introduce fundamental control concepts and theories on an easy-to-use and intuitive platform. The plant consists of a DC motor in a solid aluminum frame. The motor is equipped with a gearbox that drives external gears. All SRV02 models are equipped with a potentiometer to measure the output/load angular position. Additional sensors available include high-resolution optical encoders and tachometers. The SRV02 series serves as the base of Quanser's Rotary Control Challenges. Quanser's modular design approach allows you to readily interchange additional modules, transforming the SRV02 into a multitude of different configurations.