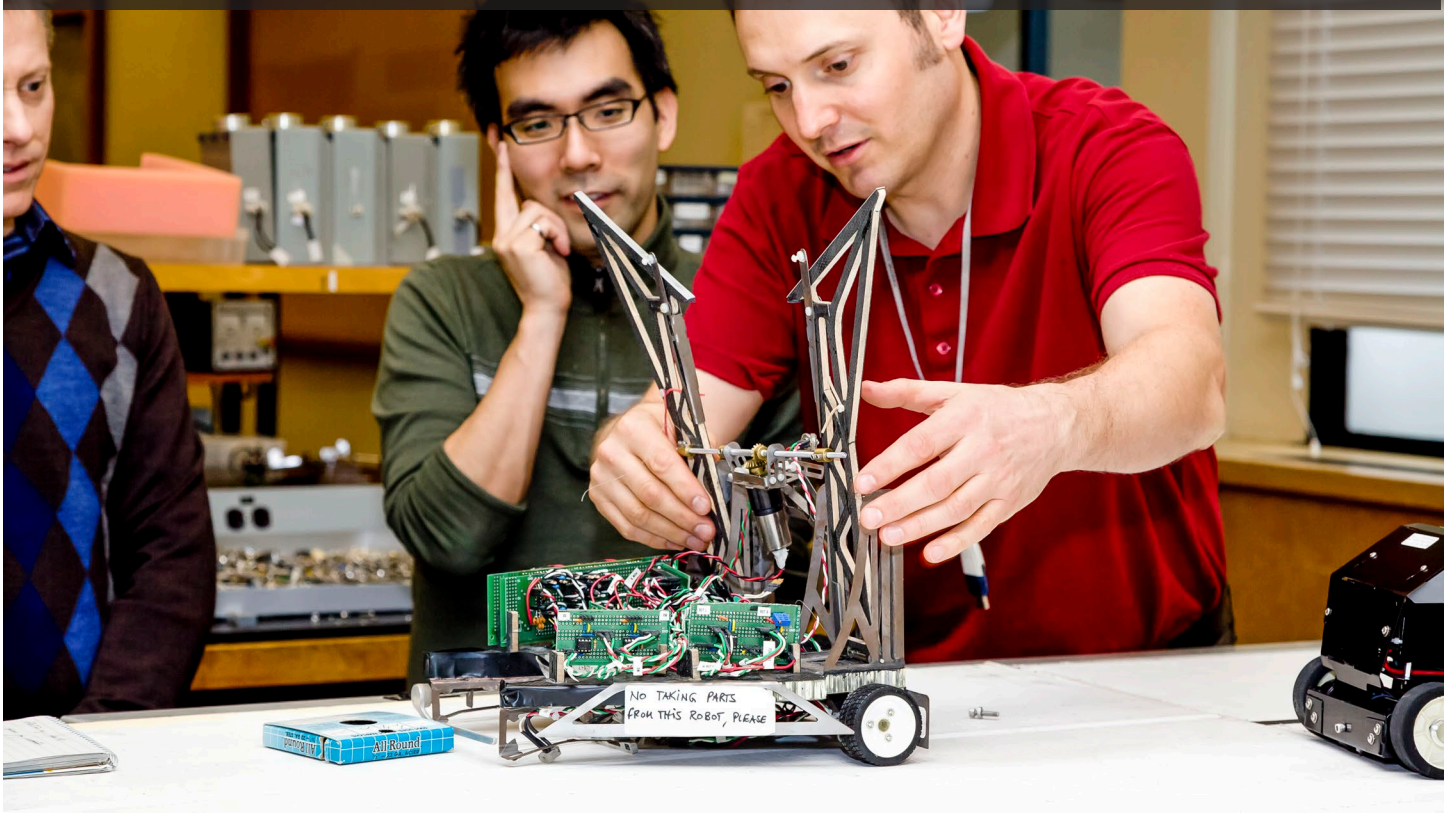
Mentoring Generations of Waterjet Savvy Engineering Students



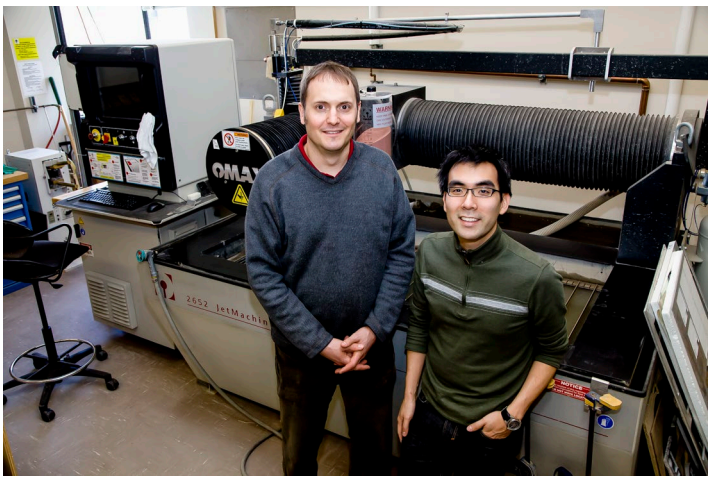
Each school year, new engineering students at the University of British Columbia's Engineering Physics School learn how fortunate they are to access a state-of-the-art machine shop for their academic projects. To become a well-rounded engineer, UBC students are encouraged to develop their inventions through rapid prototyping and experience real manufacturing situations in the machine shop. The most valuable lessons the students will learn will be from experiencing repeated, full iterations of design – from manufacturing to final evaluation, says the faculty. Since UBC's Engineering Physics School added an OMAX abrasive waterjet to their machine shop, their students are producing faster iterations of prototypes than ever before.

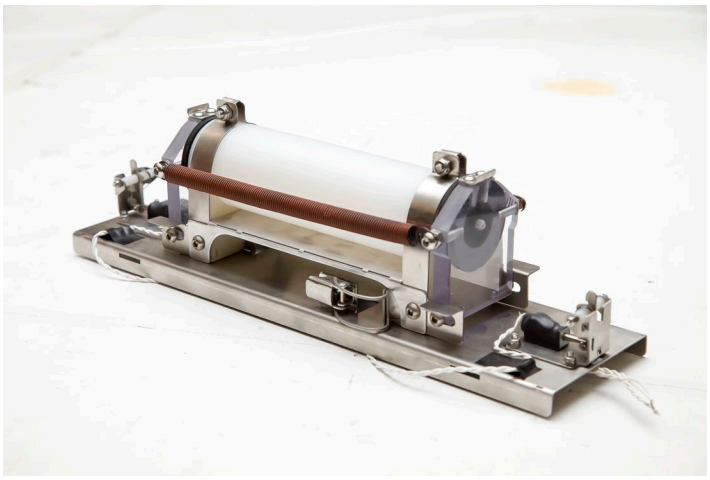
The faculty believes that a student's intuition of creating better designs can be developed when you train the student equally with formal studies and hands-on shop experiences.

"It's part of the education to learn how to machine something," Project Lab Director Dr. Jon Nakane said. "What we hope for is that through this process they learn enough so they can create a design and talk to machinists when it comes to implementing their real design."

At UBC, there are no machine shops in other departments available for students to operate equipment on their own, such as a conventional CNC mill or lathe, because of the potential risk a novice can cause to expensive equipment. In other departments, only the technical staff is allowed to operate these exclusive machines and process a student's machining request.

However, at the Engineering Physics School, students are encouraged and allowed to rack up quality shop time through actual machining experience. In particular, the faculty appreciated the accessibility and ease-of-use of their OMAX 2652 JetMachining® Center to their undergraduates. With some basic orientation and instruction on a waterjet, a beginner can machine parts within half an hour of introductory training.

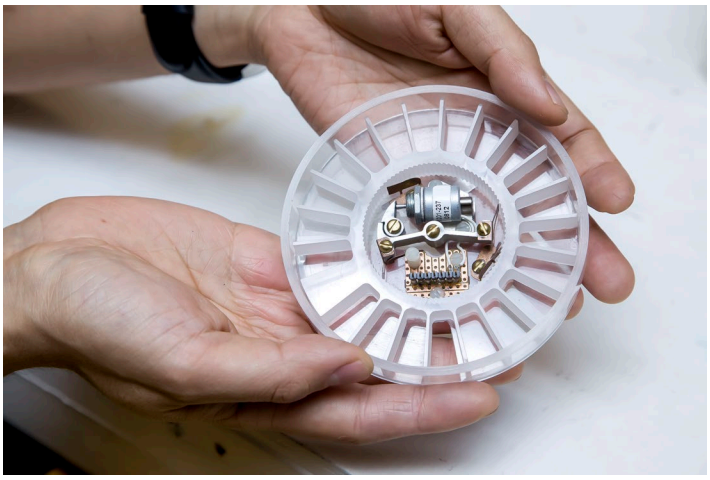




"It's hard to destroy a design on a waterjet or even the actual waterjet equipment," said Dr. Robin Coope Engineering Group Leader and waterjet adviser to the department. "But you can make a bad design, and that's where the learning comes in. If you make a bad design, you can take from that experience and build on it."

An important element of engineering is solving the right problems, he said. The OMAX waterjet technology allows the UBC engineering students to prototype faster, which in return permits them to show their clients or end-users more versions of the product. Students acquire a better perspective of the customer's expectation levels and suitability of the end product.

"Students would try and fail with different designs; realize how much checking and modification they need to do. Sometimes it's best just to build the invention and figure out on your own if it will work," Dr. Nakane said about his students exploring projects on the OMAX waterjet.



UBC ENGINEERING PHYSICS SCHOOL
FOUNDED: 1908
LOCATION: Vancouver, BC Canada

PROJECT LAB DIRECTOR: Dr. Jon Nakane
SPECIALIZES IN: Teaching UBC engineering students how to design high-performance structures and implement their ideas into real, operational end-products.

The students and faculty also discovered that abrasive waterjet technology complements laser cutting. Dr. Nakane and Dr. Coope said laser technology is a great tool to meet even finer specifications in cutting, particularly when it comes to the rapid cutting of thin material. The OMAX would be ideal for the prototyping stage when experimenting with material and thicknesses. When your design reaches the production stage, you can then completely run the project through the laser cutting process. This makes the development process more cost-effective and manageable. The students have cut wood, foam, and plastics with a laser cutter.

However, there are some engineering inventions that just require the strength of metal, Dr. Nakane said. The abrasive waterjet becomes a great planning tool for a number of applications in which a laser cannot be utilized to cut metal since it would wreak havoc to the conventional equipment.

UBC's investment in an OMAX JetMachining Center has already paid off for the department. Within the first four years of the machine's installation in the laboratory, over 400 UBC students have operated the OMAX 2652. Each school year produces another group of young engineers evaluating real manufacturing concepts with waterjet cutting and other machining solutions.

"They get a taste of everything," Dr. Nakane concluded. "The students can speak the machinist language and understand what's important, and what's not."

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