



AURUM

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The Canadian Newsletter for IEEE GOLD

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From the Editor

Welcome back to another issue of Aurum, where this time we're pleased to feature a truly diverse mix of topics, which were submitted both from across the country and from around the world!

In this edition, you'll notice that a number of changes have been made since the inaugural issue. Of significance is the colour scheme that is evident on each page, which features header and footer bars that fade from red to gold. This characteristic also appears in the maple leaf logo on the front cover, where red and gold blend to represent the colours of both Canada and IEEE GOLD.

As a publication directed toward young electrical engineers, Aurum is pleased to include a range of relevant articles in this issue, including such topics as employment at the Canadian Space Agency, engineering programs at Oxford University, and a special feature on GOLD activities in Russia.

In the next issue, we will also be including articles geared toward a general technical interest, so if you have a recent work or research project that you'd like to see in Aurum, please feel free to contact us.

Andy Balser
Publisher, Aurum

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About Aurum

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Engineering: Oxford vs. Canada

Sasha Zikic, P. Eng.

Sasha Zikic, a native of Vancouver who now teaches at the University of Oxford, provides an academic comparison of how the structure of engineering programs in Canada compares to those at Oxford.

Based upon my academic experiences in both Canada and the UK, this article provides a brief overview and comparison of the two systems used for administering undergraduate engineering programs.

One of the most significant differences in the structure of the programs relates to the academic schedules that are in place. For example, at the University of Oxford, the academic year is composed of 3 terms, named Michaelmas, Hilary and Trinity, each of which are 8 weeks long. This compares to the Canadian system which consists of 2 semesters that are 12-13 weeks long, plus a summer semester that many universities provide.

Within the Canadian universities that I've attended, the professor gives the lectures, sets the problems for the examinations, and assigns the problems, which are usually marked by his graduate students or other teaching assistants. There is usually a midterm examination and a final examination, although I have also had several tests or quizzes instead of a midterm examination. The system is different at Oxford in that each course is administered by more people than in Canada.

The lecture material that is typically provided in class is also a difference between the two systems. At Oxford, lecture material such as notes, slides, or any supporting documents are typically handed out at the beginning of class, and students primarily make only personal notes or corrections to the provided material. From my experience in Canada, it was extremely rare for me to receive any lecture material, and the vast majority of my notes were copied from the chalkboard or overhead projector used by the professor.



Engineering students at the University of Oxford.

At the universities where I was educated in Canada, the problem assignments handed in were returned with some or all of the problems marked, and the answers to the problem assignments were either made available on bulletin boards or in libraries. Rarely were individual copies given to the students. For some courses, there would be hours where teaching assistants would be available to answer questions, and typically the professor giving the course would also assign office hours for students to come and ask for assistance. At Oxford, on the other hand, the problems are reviewed during a tutorial between another member of the department and a pair of students. Although exceptional graduate students are occasionally permitted to give tutorials, a faculty member usually is the tutor. Also, the assignments here are not graded; the problems within the assignments are used to expand and reinforce the material covered in the lecture.

In addition to the lecturer and the tutor, a third faculty member writes the examinations for the courses provided. The lecturer, tutor and examiner are independent of each other, which ensures that everyone is teaching from the same curriculum.

Calling all Trekkies: Careers in Space

Helen Ho, Vancouver GOLD

Contrary to popular belief, careers at your local space agency definitely span a wider range of skills and responsibilities than just being an astronaut. Both the Canadian Space Agency and NASA have interesting opportunities for engineers. In fact 60% of positions at NASA are filled by people in positions classified as professional, engineering, and scientific.

Canadian Space Agency, St. Hubert Quebec

The agency is currently accepting applications into an engineers inventory. This public service inventory is used to recruit for temporary and permanent positions. Positions are open to Canadian citizens and permanent residents of Canada, but they prefer citizens. Salaries for engineers hired out of the inventory range from \$45,556 to \$98,134. The CSA doesn't specify particular preferences for language requirements in either official language, only listing "various linguistic profiles" as a requirement.

Salaries for engineers at the CSA range from \$45,556 to \$98,134.

For undergrads, the Canadian Space Agency does hire co-op students. So if you're an undergraduate student, your efforts are best directed in lobbying your co-op coordinator to start marketing your school program to the CSA so that they'll hire from your school. Otherwise, if your school has a self-directed co-op program, you could stretch your networking skills and contact CSA public affairs and politely ask about current or future opportunities for students:

Canadian Space Agency Reception
John H. Chapman Space Centre
(ask for public affairs)
Telephone: (450) 926-4800
e-mail: carole.duval@space.gc.ca



For this and other pictures of space, visit www.space.gc.ca

The CSA is hiring graduate students as research affiliates through the FSWEF (Federal Student Work Experience Program). They're looking for candidates that are fluent in English, French, or fully bilingual. The Space Technology Directorate is recruiting research affiliates with academic interests in these areas:

Opportunities at St. Hubert Quebec:

- space robotics (manipulator control, mobile robot navigation hardware-in-the-loop and dynamic simulation)
- spacecraft control (orbital mechanics, spacecraft attitude dynamics and control, shape and vibration control)
- advanced space structure and testing technologies (advanced spacecraft qualification techniques, miniaturization and nano-technologies)

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- spacecraft payloads (radar, antennas, radiometers, optical imagers, lidar, signal processing for remote sensing applications)
- satellite communications (power amplifiers, receivers, high data rate modulators, digital signal processing, monolithic microwave integrated circuits, optical inter-satellite links).

Opportunities in Shirley's Bay (Ottawa):

- near-field antenna pattern measurement and data analysis
- measurements of passive intermodulation and multipaction characteristics
- improving speed and accuracy of present day measurement systems
- RF measurements under simulated environmental conditions

NASA

From now until April 2004, NASA will be recruiting on various campuses throughout the Southern and Midwestern US. The recruiting calendar is available online:

<http://nasajobs.nasa.gov/recruit/calendar/index.cfm>

Positions at NASA are administered through the American civil service. So all positions will require American citizenship. Jobs, and intern-ships at NASA can be found at that recruiting site for the official site for jobs in the US federal government: <http://jobsearch.usajobs.opm.gov/a9nasa.asp>



Canadian Astronaut, Chris Hatfield (www.space.gc.ca)

Links:

Engineers Inventory for the Canadian Space Agency

<http://emplois.gc.ca/jobs/p024869e.htm>

CSA Research Affiliate program (Federal Student Work Experience)

http://jobs.gc.ca/fswe-pfete/student/dp_024_e.htm
<https://www5.psc-cfp.gc.ca/prodswep/fswep.htm>

CSA Astronaut career model

http://www.space.gc.ca/asc/eng/csa_sectors/human_pre/cao/career/toc.asp

NASA: applying for postings, and setting up a job search agent.

<http://jobsearch.usajobs.opm.gov/a9nasa.asp>

NASA's campus recruiting calendar NASA Astronaut Selection

<http://nasajobs.nasa.gov/recruit/calendar/index.cfm>
<http://astronauts.nasa.gov/>

Hamilton GOLD – Women in Engineering

Debra Messina, Hamilton GOLD Chair

Have you ever wondered why so few females pursue Engineering as a career? Is the answer clear? No! There are many studies being undertaken as to why engineering is a male dominated field. One solution, I felt, was to advertise engineering to the younger generation and show them the endless possibilities a career in engineering can bring. From this we arranged a speaker session with various female engineers to talk about their experiences both pre- and post-studies.

On November 27th, 2003, the IEEE GOLD Hamilton group hosted our very first, "Women in Engineering Panel Discussion." It was intended to provide a forum for high school guidance counselors and parents of and young women to discuss the issues with successful engineers. We had three remarkable speakers from Gennum, the IMO, and Zenon, representing three different engineering disciplines: engineering physics, mechanical engineering, and civil engineering.

It was very inspiring to see these successful women in different stages of their lives recount their stories and share their struggles and successes to an audience which contained many

high school students. In conjunction with this event, the Hamilton Section has been focusing on an Outreach committee which involves going around to various high schools and talking to students about Engineering and our experiences. This is an ongoing issue, and we feel that this is something important for the future of engineering.

Upcoming Hamilton Events (dates TBD):

- "Starting Your Own Business" – speakers present the key concepts in starting up a company which include: tax benefits, registration information, and much more.
- Linux crash course – 3 hour hands on session teaching the basics of Linux.

For more information, please contact Deborah Messina at deborah@ieee.org.

Calgary GOLD

Jason Long, Calgary GOLD Chair

Greetings from the newly formed Southern Alberta GOLD group! Things are finally getting started here in Calgary, and we look forward to a great year of meeting GOLD members and running a few events. Keep an eye out for our new website (coming soon to a computer near you!) and watch for upcoming events to help you meet fellow IEEE members and realize the full potential of your IEEE membership. If you would like to be included on the Calgary GOLD email list, please send your info to Jason at jrlong@ieee.org.

Oxford cont'd from pg 3

In Canada, I had my examinations within 1-2 weeks of the end of the semester for each course. At Oxford, students have one set of preliminary examinations at the end of the third term for the 1st year and another set of final examinations at the end of the 3rd year. Unlike Canada, where most undergraduate engineering degrees are 4-5 years in duration (depending on specialty), at Oxford the engineering science degree is a 3-year course, requiring no specialty like civil or electrical to be chosen.

Although there are many differences between the two educational systems, there is at least one commonality: students from either one can experience the joys and frustrations of studying to be an engineer!

Montreal GOLD

Peter Guy, Montreal GOLD Chair



The first official event for GOLD in Montreal was a tour of the CTV television studios. On February 18th, Bob Turcotte, the Manager of Technical Operations at CFCF, hosted about a dozen of us for a tour of their new studio. When the station moved from its old location on Ogilivie to its present location on Papineau, all the broadcasting equipment was upgraded to state-of-the-art equipment, and GOLD Montreal was lucky enough to get an exclusive look at this technology in action!

CFCF was Quebec's first private television station, launched in Montreal in 1961. After a brief review of the station's history, Mr. Turcotte and technicians Rudy Sramko and Jean-Marc Martineau, brought us to the news studio. In front of the lifelike snapshot of the Montreal skyline, we crowded the newsdesk where we saw the teleprompters and robotic cameras in action. With the help of the monitors, a few of us had the opportunity to play like Frank Cavallaro and deliver a mock weather report in front of the infamous blue screen.

In the control room, where the video and sound engineers were putting together the final touches for the broadcast, we discovered the 4 x 1 switch that controls the feed that is being broadcast. CFCF uses this box to switch between their local content and the feed (delivered via fiber-optic cable) from Toronto that supplies their commercials during the newcast. A quick saunter through the machine room that houses the servers, power supplies, backups, filters, processors, patch-panels, and various other tools brought us pretty close to 6:00 pm. Some of us darted to the control room, while others snuck into the studio just in-time to hear the director's five second count down to the launch of CFCF news with Mutsumi Takahashi & Bill Haugland. After seeing the work and technology behind such a broadcast, I'm certain none of us will watch the news the same way again!

Toronto GOLD is Formed!

Aleksandra Jeremic, Toronto GOLD Chair

The IEEE Toronto Section officially launched a GOLD affinity group late last year, and we've already held two events since November. The first, organized jointly with Hamilton GOLD, was titled "Women in Engineering." The second, titled "Mental Health in the High-Tech Workplace," was jointly organized with the Engineering & Human Environment Chapter.

What helped a lot during the initial set-up of our group was Fall 2003 IEEE Canada GOLD Leadership Training Workshop held in London. It was a great opportunity to meet GOLD representatives from all over Canada, to hear what others have done, and exchange ideas.

At this point in the year, the next event we

have planned is to hold an introductory seminar on LINUX in March. We thought it would be a good introduction to "RWL04 Real World Linux 2004 Conference & Expo," which will take place in April. The IEEE Toronto Section will have a booth, and GOLD will be coordinating this activity on its behalf. Also, even though it's still in the early planning stages, we are trying to coordinate a seminar on the topic of possible career choices that could be pursued after graduating from an engineering program, such as law or medical school.

For more information on the Toronto Section, please visit our website at <http://ewh.ieee.org/r7/toronto/index.html>.

Around the World: Russia GOLD



Oleg Stoukatch, Siberia GOLD Chair

Здравствуйте!

Greetings from Russia!

On February 13, 2003 the IEEE Russia Section was split into three parts, which proved to be a good opportunity to increase activity in Russia by forming new groups and increasing membership. Because GOLD originally belonged to the Siberian Section, several GOLD-sponsored activities are now directed from this region, which include:

SIBINFO: An annual student paper contest on Information Security

SIBCO: AN IEEE Siberia Conference on Control and Communications

In October 2003, our SIBCON conference was a great a success, showing that it is a premier event in Siberia. Co-sponsored by ComSoc and the IEEE Foundation, the conference was organized by the department of Computer-aided Measurement Systems and Metrology at Tomsk Polytechnic University. The IEEE Tomsk Chapter and Student Branch also contributed by providing information support to the conference.

Did you know...

- Siberia makes up more than 75 percent of Russia's land mass
- In terms of geography, Siberia is larger than Canada
- Siberia is so large that a person standing on the beach in Nova Scotia is closer to Moscow than a person standing on the eastern coast of Siberia
- The name Siberia comes from sibir, a Mongolian word for "sleeping land"



IEEE Tomsk GOLD in Siberia, Russia

We cordially invite you to participate in any of our meetings, in particular, we invite you to attend the SIBCON-2005 Conference, which will be taking place on October 21 and 22, 2005 in Tomsk, Russia.

Topics that will be covered include:

- Mathematical Simulation and Modeling in Modern Technologies of Control and Information Processing
- Instruments, Methods and Algorithms for Measurement, Testing, and Diagnostics of Communication and Control Systems
- Basic Problems of Communication and Control Theory
- Crypto Protection of Communication
- Digital Video and Image Processing

The sixth IEEE-Siberian conference SIBCON-2005 aims to offer opportunities to learn and to share information on the latest advances in communications and control systems. The conference is organized by the IEEE on a regular basis in order to promote interdisciplinary discussion and interaction among scientists and engineers with an emphasis on IEEE membership.