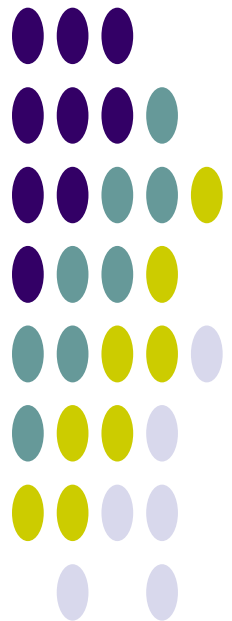


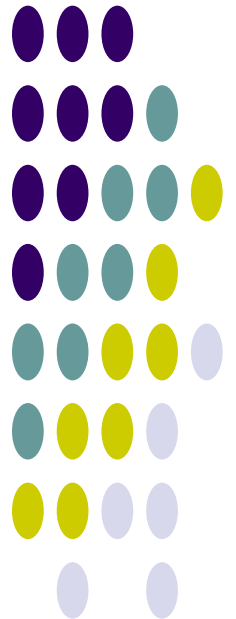
By the Bootstraps: Building an Engineering Collection from the Ground Up

By John Dupuis,
Science & Engineering
Librarian,
York University, Toronto

ASEE Annual Conference
Montreal, June 2002



Environment





Abstract

- York University is a large urban university in Toronto, Canada. While mostly known as an institution with a strong focus on the arts, humanities and social sciences, York has a set of small but active science programs. As part of a plan to increase the emphasis on applied sciences, York initiated its first engineering programs in Computer, Space and Geomatics Engineering and Engineering Physics. In the fall of 2001, York welcomed its first ever engineering students into these new programs. This poster session will present the experiences and strategies of a new librarian building a library presence for these new programs. Also covered will be the methods used to build journal, reference and monograph collections as well as efforts to forge links with the new faculty and students. All these activities are situated within an environment of “Big Deals,” budget cuts and severe financial restrictions that have become the norm in many universities.

York University



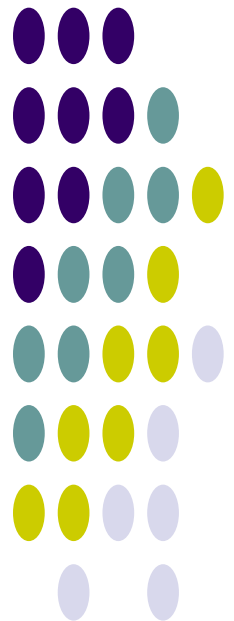
- Third largest university in Canada, primarily known for Arts, Humanities and Social Sciences.
- Prestigious faculties include Osgoode Hall Law School & Schulich School of Business.
- There is a new emphasis on applied science to get more government funding
- Non-science/science undergrad student ratio: 30,000 : 3,200
- For faculty: 1,100 : 140
- For grad students: 4,194 : 290
- Remaining Eng students Fall 2001: 45
- Eng students in Fall 2002: about 120
- Number of engineering faculty: 3

Steacie Science Library



- Smallest library in the York system
- Print journal collections are being rapidly replaced by electronic-only consortial deals – ACS, RSC, IEEE, IOP, APS, Wiley, Kluwer, Springer, Elsevier...
- Monograph collection is in pretty good shape, even after a number of years of budget cuts
- Currently two librarians cover all the science & technology subjects at Steacie – workload is a serious subject at York Libraries. York has one of the lowest student to librarian ratios in ARL
 - I started August 2000 & have a B. Comp. Sci.
 - I cover Physics & Astronomy, Math & Stats, Computer Science and Engineering
 - I also serve as part time E-Resources librarian and EndNote Support librarian

The Programs





Overview

- New programs are:
 - Computer Engineering
 - Space Engineering
 - Engineering Physics
 - Geomatic Engineering (Surveying)
- Programs build on faculty & courses in existing programs
- Programs were chosen either to fill a poorly served niche in engineering education or which are in very high demand
- Programs will place an emphasis on design issues – a holistic approach to engineering
- First three years each have a full year design course, final year has a capstone project



Computer Engineering

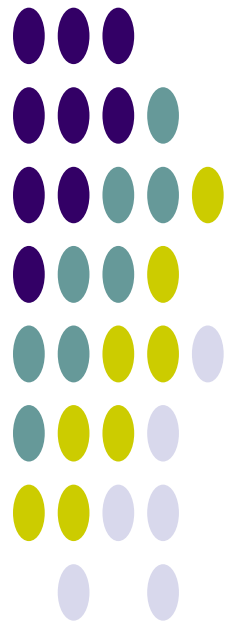
- There are hardware and software engineering streams
- Computer engineering builds on an existing large and active computer science program
- New & existing computer science faculty will teach the software engineering.
- Existing physics faculty will teach most of the electronics
- There is one new faculty member to teach general electrical engineering topics
- This program is by far the most popular

Space Engineering, Engineering Physics & Geomatic Engineering



- **Space engineering** builds on strengths in the Physics & Astronomy and Space & Communications departments as well as Earth Sciences.
- **Engineering physics** will largely consist of existing Physics & Comp. Sci. courses focusing on optical communications
- **Geomatic engineering** will require the most new courses but does build on Geography & Earth Science departments
- Space engineering most popular of three.
- Two new faculty have been hired for geomatic engineering
- Due to low interest:
 - Engineering Physics program on hold
 - Geomatics & Space programs will share a common second year

Getting Started



The Existing Collections



- Fairly good in:
 - Computer science subject such as computer vision, human-computer interaction, operating systems and real-time systems
 - Space & communications subjects such as remote sensing & satellite communication
 - Physics subjects such as optics
 - Aggregators & electronic-only publisher packages provide lots of the journal coverage
- Need work in:
 - General reference works from all fields: handbooks, encyclopedias
 - Hardware engineering including electronics, circuits, wireless systems, embedded systems
 - Software engineering including systems analysis, metrics, management
 - General engineering, especially introductory works from all fields: mechanical, civil, transportation, materials, industrial design, ergonomics, history, ethics



Read, Read, Read

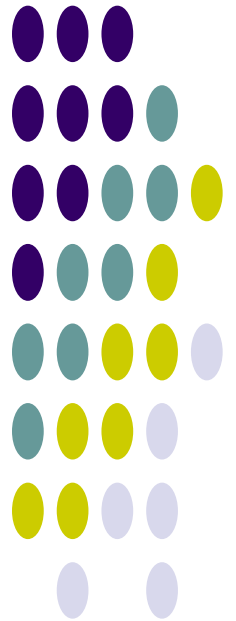
- Read about scholarly communication patterns in engineering to get an idea of how engineers work and what their information needs are
- Read as much as possible in the library literature about other engineering librarians' experience starting collections and offering services
- Take a look at standard reference books on engineering information: mostly not all that helpful
- Search the Web: what do similar courses at other schools use and what do other libraries have in their collections
- Join ELDNET-L to hear what other engineering librarians are doing

Challenges & Opportunities



- Challenges:
 - Very severe financial constraints: initial funding request to establish new collection: C\$100,000 to base for IEEE & other new journals + C\$30,000 one-time-only for monographs. Received: C\$0
 - No profs until just before first year started, so it was hard to know exactly the direction of the program, especially the design courses
- Opportunities:
 - To build a collection from ground up, to take part in starting an important new program
 - Challenging and exciting way to start a new career – this is my first librarian position
 - To establish a strong relationship between the faculty and the library
 - To use the establishment of the new engineering programs as a way to convince the library administration to commit to the full IEEE Digital Library product

The Collection



Building the Collection: General Principles



- Need to build a balanced collection: reference, monographs, journals, indexes, proceedings, web sources
- Design emphasis of program means that a very broad approach is needed, not just focused on the specific programs
 - Will need basic reference works and introductory texts in many areas
 - Continue to order heavily in approval plan to get as many new and varied books as possible
- Can't ignore the influence of the Web: students want to use it for their research, so have to bring the right parts of it to them
- Aggregator databases & publisher packages like Expanded Academic and Springer can fill in a lot of gaps in the journal collection

Tough Choices: Indexes



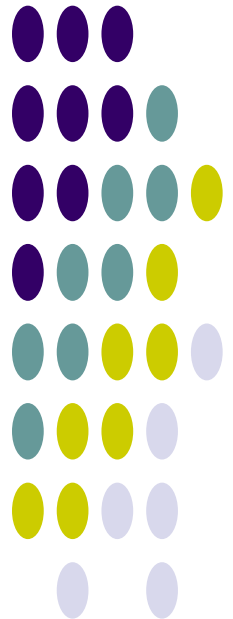
- With only junior-level undergrads and no grad students, having indexes in the short term is not that vital
- Cancelled INSPEC CD ROM version – it was hardly used at all – freeing money for other, more immediately useful products
- We do have Applied Sci & Technology & Web of Science to satisfy basic needs
- Don't need to get Compendex at this point – too general for our needs
- Aggregator databases such as ABI/Inform can function as indexes: provide a lot of very good engineering content with no new investment
- Ultimately, will need to make some decisions before accreditation: get either online version of INSPEC or Compendex on a permanent basis



Getting IEEE Xplore

- Rationale:
 - Having the product is a recruitment tool for Computer Science & Engineering departments
 - Contains useful material for many programs, not just electrical engineering & CS: aerospace, biomedical, remote sensing, quantum electronics...
 - Can redirect money from other sources: cancel IEEE print, cancel little used INSPEC, savings from CNSLP and other consortial deals
- Results:
 - Received it in February 2001!
 - Usage has grown steadily in the past 18 months
 - Did a drop-in/training session with IEEE in CS department conference room as a way of promoting both IEEE Xplore and the library (Thanks, Ruth!)

Getting Books





For the First Year

- Ordering in preparation for the first year was challenging for several reasons:
 - There were no professors for the program until August, only one course outline for one new engineering design course
 - It's hard to order for engineering design courses until you see what the assignments are like and exactly what is covered in the syllabus
 - There were no one-time-only funds to order books – had to use existing budget
 - Ordered quite a few reference books mentioned in Lord's *Guide to Reference Sources in Engineering*.
- Ordered from syllabus of design course
- Ordered as much as possible from approval plan
- Ordered some general engineering books



For the Second Year

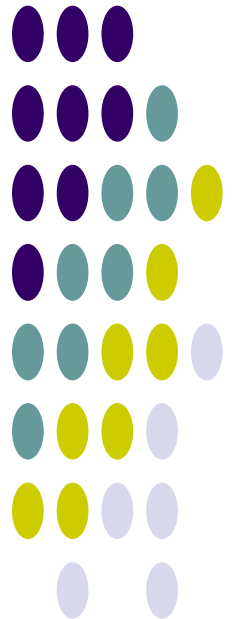
- Second year was much easier to prepare for:
 - Could ask profs about what they were covering. They gave lots of feedback and suggestions about what to acquire and what could be useful.
 - Had course syllabi for second and third year courses
 - Had experience with first year's assignments
 - Was able to order a couple of new journals
- Continued ordering heavily from approval plan
- Ordered reference titles heavily based on courses: lots of handbooks & encyclopedias on wide range of topics
- Enough one-time-only money did appear to order about 200 books

For the Second Year (cont'd)



- Partial list of subjects ordered:
 - Technical communication
 - Career guides
 - Math & stats for engineers
 - Programming for engineers
 - Software engineering: metrics, management
 - Robotics and embedded systems
 - Basic standards references
 - Some advanced aerospace engineering
 - Ergonomics & industrial design
 - Engineering law, ethics & professional practice
 - Mechanics & strength of materials
 - History of engineering and technology
 - Project management
 - One or two basic texts each on civil, mechanical, automotive, construction, transportation engineering and others

Year One: 2001-02





Faculty Liaison

- Already have a good relationship with faculty in Computer Science & Physics & Astronomy departments
- Attend department meetings for these departments every fall to talk about new developments
- Attended an engineering section coordinators meeting in December to talk about current requirements and what to expect in the future
- Keep in close contact with departmental library reps – no one designated yet for engineering but I “elected” one of the profs to serve that role
- The faculty have been very good with suggestions and have supported library involvement

Services to the Students



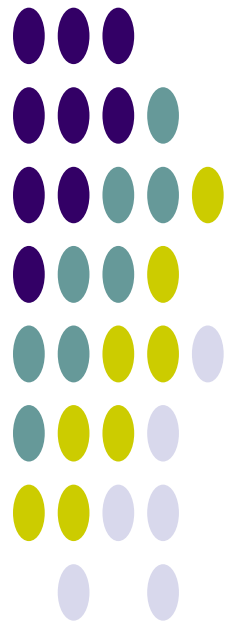
- Only 75 students started first year
- Difficult to judge the number of reference transactions: perhaps 10-15 total?
- I did organize a 45-minute instruction session for the class: about 50 came
 - Gave a brief tour of the library
 - Showed catalogue basics
 - Showed basics of a couple of indexes & full-text sources
 - Created an engineering research web portal highlighting library & Internet resources
- Since we don't have an instruction room, we weren't able to hold any hands-on activities in the sessions
- Overall, the sessions weren't too successful: prof reported that few students used library resources in their assignments

Building a Library Culture



- Progress to date has been modest:
 - Students right out of high school generally have very little experience with libraries
 - “If it isn’t on the Internet, it doesn’t exist” is most of the students’ first inclination.
Engineering students are bright, motivated and confident in their abilities. They also have very heavy workloads – they need their info fast
 - For the first year, we just didn’t have a lot of the materials that they needed, especially to support their design projects
- What to do:
 - Meet them on their turf: expand the current web portal to help them find what they need
 - Use the main library’s instruction room: some might not come, but it’s important to have a hands-on class for engineering students
 - Use a “test your searching” format for class

Year Two: 2002-03



Collections: Preparing for Year Three



- Books:
 - More of the same: continue ordering from the approval plan
 - Will have to keep identifying gaps in the collection and fill them. This will generally be on a topic by topic basis
 - Continue to liaise with faculty to see what kind of projects students are doing and what topics are being covered in class
- Journals:
 - We're ok for now, but I would like to restore subscriptions to some AIAA journals
 - Advocate maintaining Business Source Premier subscription – has lots of good content
- Indexes:
 - Will likely be using one-time-only indirect research funding to do a one year trial of INSPEC online. Will have to monitor its use very carefully

Services to the Students



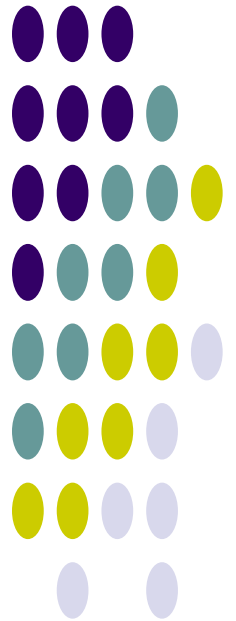
- Three key components:
- Create a better instruction program focusing on information literacy training. The students need to be able find and evaluate Web sources. There is no way to stop them, so they should at least be a bit better prepared. Instruction should be interactive and hands-on with immediate feedback for the students
- Enhance the Web portal to include more focused resources as well as highlight full-text library databases better. Target sources selected for the design process
- Engage the faculty to encourage the students to make use of the library and what it has to offer

More Opportunities & Challenges



- Doing what works:
 - Keep in close contact with faculty by attending meetings of various departments: Engineering, Computer Science, Physics
 - Keep in close contact with course directors to make sure we have the books that are needed
- Opportunities:
 - Indirect funding support from the Canadian government is an opportunity to boost the research level collections
 - To take advantage of one-time-only funds to improve collections
- Challenges:
 - To design a hands-on information literacy program for engineering design students to help them sort through all the information options available to them
 - To try and engage the students with the library₂₉

It's a Process





Beyond 2002-2003

- Accreditation is on the horizon – Canadian Council of Professional Engineers
- Graduate programs are probably on the horizon, so we will need the collections to support them
- Look more closely at journal holdings and fill in gaps from engineering societies to satisfy research needs for faculty and senior undergrads
- Solve the index puzzle – find long-term funding to commit to INSPEC and/or Compendex
- Continue to build a strong relationship with faculty
- Continue to connect with students and help them with their research needs



Selected Bibliography

- Anderson, C. J., M. Glassman, et al. (2001). "An Investigation of Factors Affecting How Engineers and Scientists Seek Information." Journal of Engineering and Technology Management **18**(2): 131-155.
- Brin, B. L. (2001). "Building a Library Collection to Support New Engineering Programs." Science & Technology Libraries **19**(3/4): 19-38.
- Clemmons, L., P. Gibbs, et al. (2002). "Information Literacy Competency and its Integration into the Engineering Curriculum". ASEE Region I Spring Meeting, West Point, NY. Last checked June 7, 2002 <http://elt.sunynassau.edu/~webinfo/ASEE2002/H-IV-3-c_paper.pdf>.
- Cribb, G. (1998). "Information Skills Training for Engineers." ASEE Annual Conference and Exhibition, Seattle, WA. Last checked June 7, 2002 <<http://www.asee.org/conferences/search/20031.pdf>>.
- Davis, P. M. and S. A. Cohen (2001). "The Effect of the Web on Undergraduate Citation Behavior 1996-1999." Journal of the American Society for Information Science and Technology **52**(4): 309-314.
- Fosmire, M. (2001). "Bibliographic Instruction in Physics Libraries: A Survey of Current Practice and Tips for Marketing BI." Science & Technology Libraries **19**(2): 25-34.
- Fjallbrant, N., J. Fjallbrant, et al. (1998). "Information Literacy Training and Support Programs for Engineers and Scientists." CALISCE '98 4th International Conference on Computer-Aided Learning and Instruction in Science and Engineering, Gothenburg, Sweden. Last checked June 7, 2002 <<http://educate.lib.chalmers.se/DEDICATE/docs/calisce.pdf>>.
- Hertzum, M. and A. M. Pejtersen (2000). "The Information-seeking Practices of Engineers: Searching for Documents As Well As for People." Information Processing & Management **36**(5): 761-778.
- Holmes, C. O. and et al. (1994). "BI for an Undergraduate Engineering Course: An Interactive Model for a Large-Enrollment Course." Research Strategies **12**(2): 115-21.
- Lawal, I. (2001). "Developing Collections and Services for New Engineering Programs: Challenges of the Digital Era." ASEE Annual Conference and Exhibition, Albuquerque, NM. Last checked June 7, 2002 <<http://www.englilb.cornell.edu/eld/conf/01/lawal.html>>.
- Leckie, G. J. and A. Fullerton (1999). "Information Literacy in Science and Engineering Undergraduate Education: Faculty Attitudes and Pedagogical Practices." College & Research Libraries **60**(1): 9-29.
- Moran, B. (1998). "Planning a Program of Instruction in Information Management for Engineers." 10th Australasian Conference on Engineering Education, Gladstone, Queensland. Last checked June 7, 2002 <<http://www.library.unisa.edu.au/papers/engineer.htm>>.
- Rockland, R. H. (2000). "Reducing the Information Overload: A Method on Helping Students Research Engineering Topics Using the Internet." IEEE Transactions on Education **43**(4): 420-425.
- Stenger, J. B. and J. M. Goode (2000). "An Intervention to Improve Information Research Skills." ASEE Annual Conference and Exhibition, St. Louis, MO. Last checked June 7, 2002 <<http://www.asee.org/conferences/search/20359.pdf>>.
- Ward, M. (2001). "A survey of engineers in their information world." Journal of Librarianship and Information Science **33**(4): 168-176.

Full bibliography available on request

Your Suggestions Are Always Welcome



- Send your comments, suggestions and even bibliographies to: jdupuis@yorku.ca