Computer Science

- BComp Computer Science
- BComp General Program
- BComp Software Engineering
- MSc Computer Science
- MCTI Cybersecurity and Threat Intelligence
- PhD Computational Science

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Summary

The library provides **strong** support for the University of Guelph's Computer Science programs.

Recommendations

- Commercial publishers are reluctant to license e-textbooks to libraries because revenue from students is central to their business models. We can help instructors source course texts from our existing collections or find appropriate e-book licenses that avoid costs to students and ensure multi-reader access. The library welcomes suggestions for new purchases and subscriptions to continue strengthening research collections focused on theoretical, applied, and interdisciplinary aspects of Computer Science.
- Consider integrating information literacy skills into the undergraduate programs through the capstone courses CIS*4900/CIS*4910. This could be done through an in-class librarian visit or encouraging students to meet with librarians for one-on-one consultations. At the graduate level, IL librarians would welcome an opportunity to discuss how best to provide research skills support, potentially through CIS*6890. In our experience, integrating information literacy into the curriculum is a very effective way to ensure that students can build skills over the course of their degree.
- Consider referring Computer Science students for writing appointments so that they can improve their writing skills for writing theses and dissertations. Writing Services would welcome the opportunity to be invited into the graduate seminar course to talk about writing in Computer Science.
- Encourage students to contact the library about using the U of G Research Data Repository to store and preserve final scripts, codes and programs for archival purposes. Within CEPS, researchers in the School of Engineering are active users of the U of G Research Data Repository, but we have not seen similar level of usage with Computer Science students and researchers.
- Encourage students with large datasets to contact the library for support in the preparation of their datasets for inclusion in an external repository (e.g. GenBank, Federated Research Data Repository (FRDR)).

Part 1: Collections

The library provides strong collections support for undergraduate, graduate, and interdisciplinary programs in Computer Science.

E-journal, book, and index coverage is excellent. Library participation in national and provincial purchasing consortia results in better collections than would be expected at comparable, less well-connected institutions. New acquisitions are almost exclusively online, facilitating remote access by multiple readers.

In the past five years, the library has reviewed nearly 50 programs and new courses focused on various aspects of computing. In parallel with this curriculum expansion, the library collection has undergone corresponding growth and modernization to support developments in the field. Furthermore, as most STEM disciplines (and many in the Humanities and Social Sciences)

adopt increasingly computational approaches to research, applied works in areas such as agriculture, environmental science, epidemiology, and omics sciences are being acquired in greater numbers.

Journals

The library provides access to more than 55,000 e-journals across all disciplines. The collection in disciplines relevant to computer science and engineering is very strong. Students can access nearly complete journal suites, often back to the first volume, from publishers such as:

- ACM Digital Library
- Cambridge University Press
- Elsevier
- IEEE Xplore
- Oxford University Press
- SAGE
- Society for Industrial & Applied Math (SIAM)
- Springer-Nature
- Taylor & Francis
- Wiley

Where gaps exist, it is generally for publishers to which the library subscribes to select titles rather than complete 'bundles.' New subscriptions are added in response to evolving demand and as budgets permit, but students can obtain non-subscribed journal articles via the interlibrary loan service.
The library provides access to most of the journals with the highest impact factors in computing-related disciplines, according to Clarivate's *Journal Citation Reports* (JCR) database. By subject category:

JCR Subject Category	Available at Guelph
Artificial Intelligence	24 of 25 titles
Automation & Control Systems	25/25
Computer Information Systems	24/25
Computer Science Theory & Methods	24/25
Cybernetics	22/22
Electrical & Electronic Engineering	25/25
Hardware & Architecture	25/25
Information Science & Library Science	23/25
Interdisciplinary Applications	25/25
Software Engineering	25/25
Statistics & Probability	25/25

Books and E-books

The acquisition of e-books is rapidly replacing print, facilitating convenient remote access. The library offers a broad selection of Computer Science books from publishers such as:

- ACM
- Elsevier
- Emerald
- IET
- IEEE-Wiley
- IGI Global
- Morgan & Claypool Synthesis collection

- Oxford University Press
- Springer Computer Science collection
- Taylor & Francis

Search Tools to Access the Literature

Omni is an academic search tool which lets students and researchers simultaneously search the U of G library collections plus the library collections of most of the other university libraries across the province. Omni facilitates access to full-text books, articles, streaming media, etc. by linking to library subscriptions and Open Access scholarly works.

The library subscribes to a variety of online indexes to the scholarly literature, including:

- ACM Digital Library
- American Society of Mechanical Engineers
- Compendex / Engineering Village
- Gartner Research (IT business reports)
- IEEE Xplore
- INSPEC
- MathSciNet
- Web of Science

Streaming Media and Online Training Resources

Video resources are increasingly being integrated in the curriculum. In support of this trend, the library is actively developing a robust streaming media collection which includes documentaries, instructional videos, feature-length films, and news clips.

The university subscribes to *LinkedIn Learning*, a platform offering thousands of applied technology courses delivered via streaming video. For basic skills development and supplemental learning, it could be a valuable resource for Computer Science students at all levels.

Curriculum Resources

The E-Learning & Reserves unit makes resources readily available to students with integrated links in the course management platform, CourseLink, and with access points in Omni. Where possible, course reserves resources are made available online.

Part 2: Academic and Professional Skills

Research and Information Literacy (IL) Skills

Information Literacy (IL) librarians support students by providing:

- Individual appointments.
- In-class guest lectures.
- Co-curricular workshops such as Dissertation Boot Camp and Brain Food for thesis management.
- Customized digital learning objects, such as online course guides.

The IL team takes a broad view of research skills and provides instruction and support on:

- developing a research question.
- doing preliminary research or researching around a topic.
- search and retrieval of scholarly and non-scholarly sources.
- knowledge synthesis projects, such as literature, systematic or scoping reviews.
- evaluating information for bias, authority, reliability, and other indicators of suitability.

The IL team prioritizes support to large required and core courses that have research skills or digital media literacy assignments. IL librarians aim to scaffold information literacy instruction throughout the curriculum to provide students with the opportunity to build on their skills year over year.

To date, IL librarians have not been involved in any of the required or elective courses in the undergraduate Computer Science programs under review. Students in the capstone courses CIS*4900/CIS*4910 who are conducting research projects may benefit from IL librarian support, whether through an in-class librarian visit or a one-on-one consultation.

At the graduate level, students working on theses, dissertations, or major research projects are primarily supported via one-on-one consultations. IL librarians have also been involved in CIS*6560, which is a required project-based course for students enrolled in the MCTI Cybersecurity and Threat Intelligence program, as well as CIS*6060 and CIS*6420, which are elective course for students enrolled in the MSc Computer Science program. IL librarians have identified CIS*6890 for the MSc Computer Science and PhD Computational Sciences programs as possible fits for IL support, and IL librarians would welcome an opportunity to discuss how best to provide research skills support to the students in these courses.

Writing Services

Writing specialists support students by providing:

- Individual writing appointments.
- In-class guest lectures.
- Curricular support and resources for instructors and graduate student supervisors.
- Co-curricular programming such as Dissertation Boot Camp, Brain Food for thesis management, Writing Tune-Up for grammar, and Academic Writing Style.
- Academic integrity support through Academic Integrity at the University of Guelph www.academicintegrity.uoguelph.ca and by helping students understand and prevent academic misconduct.

Writing Services sees annually a few hundred students from the College of Engineering & Physical Sciences for writing consultations, but very few CIS students. Numbers for CEPS were extremely low in 2020-21, although Writing Services continued to offer online consultations during COVID-19. Writing Services did not receive any requests from CIS to provide in-class writing sessions from 2017-2021.

English as an Additional Language (EAL)

English language programming supports students to develop skills in English communication, pronunciation, presentation, reading, and writing skills. Support is offered through:

- Individual appointments.
- Co-curricular workshops and short courses such as EAL Graduate Writing Camp, Pronunciation Groups, Talk like an Academic, and Write like an Academic.

- Curricular support and resources for instructors and graduate student supervisors.

Learning Services

Learning Specialists support students' academic skill development through:

- Individual appointments.
- In-class guest lectures.
- Working with faculty to develop assignments, assessment, and in-class workshops on topics such as working in groups, presentation skills, poster presentations, and exam preparation, and customized student resources (such as an error analysis worksheet for midterms).
- Co-curricular programming such as Brain Food (thesis management), Presentation Boot Camp, and Control Academic Stress.

Learning Services did not provide any in-class workshops to courses in Computer Science over the past four years.

Scholarship and Data Services

The Research & Scholarship (R&S) team provides support for students' data and research activities, especially at the senior undergraduate and graduate levels. through:

- Individual appointments.
- In-class guest lectures.
- Co-curricular programming such the Data Skills Workshop Series, the Scholarly Communications Workshop Series, workshops on acquiring, analyzing, and visualizing data, using research software, cleaning, coding, depositing data into Dataverse, and data management plans.
- Customized digital learning objects such as instruction sheets, videos, and tutorials.
- The library's Data Resource Centre which provides access to statistical data resources and software and specialist support for the use of GIS data, statistical software, and survey software.
- The library has installed ArcGIS, Excel, R, SPSS, SAS, and Matlab on all library workstations.
- Administration of the University's institutional repositories:
    - The Atrium for institutional open access research.
    - Dataverse for research data from all disciplines created by researchers at the University of Guelph.
    - The Agri-Environmental Research Data Repository to preserve and provide access to agricultural and environmental data produced during University of Guelph research projects.

Although we do not collect program level data on our workshop attendees, graduate students from the sciences comprise most of our participants. Although we do not collect program level data during our individual appointments, the majority of our participants are graduate students from the sciences with a large proportion of those students seeking statistical support.

Electronic Theses and Dissertations (ETD)

University of Guelph Institutional Repository, the Atrium, houses University of Guelph student theses and dissertations.
Computer Science theses and dissertations added to the Atrium (2019-2020):16 MSc theses and 2 PhD dissertations.