

## Computer Science at Trent

Society is in the midst of a technology revolution, which is fueled by the advancement of knowledge in computing. Students in the Computer Science program will bring the tech of tomorrow to life as they design, implement and integrate software applications for devices from supercomputers to game boards, and prepare for careers that blend technologies like databases, networks, and telecommunications, with elements of ethics, law and culture in the ever-changing tech sector.

Co-op education combines academic instruction and practical experience, allowing students to develop work skills and gain experience while obtaining a formal education. The Computing & Information Systems (COIS) Co-op program consists of eight academic (study) terms interspersed with three paid, 4-month work terms. The COIS Co-op program will consider full-time paid positions that will provide students with the opportunity to learn while performing productive work. Employers supervise co-op students and evaluate their performance, and Trent's COIS Co-op Coordinator will monitor students' progress on the job.

## Why Trent Co-op?

Trent students are problem-solvers, critical thinkers, and excellent communicators. They are ready and eager to take on new learning experiences, which means your workplace gains a team member with fresh ideas, unique perspectives, and valuable knowledge. When you have the direct experience of working with future full-time candidates while they are still university students, you can instill core skills and expertise early on in their careers. This benefits your future recruitment and hiring efforts as you'll have a pool of candidates who already have your preferred skills and understand your business.

Co-op work terms consist of 4 months (16 weeks) of paid, full-time (35-40 hours/week) work experience, giving students the opportunity to manage well-defined special projects at your organization.

### Computer Science Co-op Work Term Schedule

|        | Fall         | Winter       | Summer       |
|--------|--------------|--------------|--------------|
| Year 1 | Study Term 1 | Study Term 2 | Study Term 3 |
| Year 2 | Work Term 1  | Study Term 4 | Work Term 2  |
| Year 3 | Study Term 5 | Study Term 6 | Work Term 3  |
| Year 4 | Study Term 7 | Study Term 8 |              |

### Benefits of Hiring a Computer Science Co-op Student

- Meet short-term hiring needs cost effectively and/or help staff special projects.
- Provide coverage during vacation periods, maternity leaves, and peak workload times.
- Fill knowledge and skill gaps.
- Build your brand and expand the profile of your organization.
- Establish relationships with potential future employees.
- Claim the Ontario Co-operative Education Tax Credit (CETC) (more information below).

## Courses Completed Prior to the First Work Term

- COIS 1010H: The Digital World  
Core topics examine the underlying technologies of both computing and information systems and how they have become an integral and indispensable part of our daily lives.
- COIS 1020H: Programming for Computer Science  
Core topics include sequencing, selection, iteration, simple data types, expressions, and arrays, as well as the object-oriented notions of classes, methods, inheritance, and polymorphism.
- COIS 1620H: Introduction to Information Systems  
Core topics include the use of information systems for strategic advantage, their basic underlying technologies, the types of information systems and how they are constructed, managed, and replaced, as well as their ethical and legal use.
- COIS 2020H: Data Structures and Algorithm  
Using more advanced programming language features, core topics include arrays, linked lists, hash tables, binary heaps, and binary search trees.
- COIS 2240H: Software Design and Modelling  
Using the standard Unified Modeling Language (UML) to specify design, core topics include use cases; classes and class membership; aggregation, composition, and inheritance; virtual functions and polymorphism; state diagrams; and design patterns
- COIS 2300H: Computer Organization  
Core topics include the central processing unit, memory hierarchy, and input/ output organization. Topics are supplemented with assembly language programming.
- COIS 2830H: Multimedia and Design  
Core concepts include the discoverability of features, understanding diverse human users, complexity of feedback, and how computer systems interpret and react to human actions
- COIS 3400H: Database Management Systems  
Core topics include the relational model, entity-relationship diagrams, relational algebra, SQL, database application development, storage and indexing, and normalization. Topics are illustrated using a relational DBMS
- COIS 3420H: Web Application Development  
Core topics include front-end design, client-side scripting, server-side programming, database connectivity, data persistence, security, extensible mark-up, usability, and accessibility
- MATH 1550H: Probability !: Introduction to Probability  
Probability, random variables, probability distributions

## Skills Developed in Computer Science

- Ability to see a bigger picture & to exploit the inter-relationships among systems for competitive advantages
- Coding using C#, HTML/CSS, Java, Python, SQL
- Conduct technical feasibility studies
- Data Analysis and Data Visualization
- Evaluate software/systems design
- Integrate different approaches to system design
- Knowledge of common Operating Systems
- Knowledge of theoretical and applied aspects of computer science
- Software roll-out and future upgrade planning
- Solid foundation in the science and methodologies of computation and databases
- Strong analytical, technical and programming abilities
- Testing/Analyzing/Debugging software

## Employer Wage Subsidies

Through the [Student Work Placement Program](#), co-op employers are eligible to apply for wage subsidies through one of the following funding recipients:

- [Biotalent Canada](#)
- [Canadian Agricultural Human Resources Council](#)
- [Canadian Media Producers Association](#)
- [Cultural Human Resources Council](#)
- [ECO Canada](#)
- [Electricity Human Resources Canada](#)
- [Excellence in Manufacturing Consortium](#)
- [FCCQ](#)
- [Food Processing Skills Canada](#)
- [Information and Communication Technology Council](#)
- [Magnet Student Work Placement Program](#)
- [Ontario Chamber of Commerce](#)
- [Technation](#)
- [Tourism HR Canada](#)
- [Trucking HR Canada](#)
- [Venture for Canada](#)



Hiring students in Computer Science Co-op could earn you a credit of up to \$3,000 through the [Ontario Co-operative Education Tax Credit](#).

Co-op employers post their positions on the [Student Experience Portal](#). Through this platform, students apply to positions, employers view applications, invite candidates to interviews, and complete end of work term evaluations. To create an employer account on the portal, visit [trentu.ca/sep](http://trentu.ca/sep)