



**FOR APPROVAL**

**PUBLIC**

**OPEN SESSION**

**TO:** UTSC Academic Affairs Committee

**SPONSOR:** William Gough, Vice-Principal Academic and Dean  
**CONTACT INFO:** 416-208-7027, vpdean@utsc.utoronto.ca

**PRESENTER:** Mark Schmuckler, Vice-Dean Undergraduate  
**CONTACT INFO:** 416-208-2978, vdundergrad@utsc.utoronto.ca

**DATE:** January 8, 2019 for January 15, 2019

**AGENDA ITEM:** 6

**ITEM IDENTIFICATION:**

Undergraduate Major Modification- Specialist/Specialist Co-op Programs in Computer Science, Closure to Streams in Health Informatics

**JURISDICTIONAL INFORMATION:**

Under section 5.6 of its Terms of Reference, the Committee is responsible for the approval of “Major and minor modifications to existing degree programs.”

The AAC has responsibility for the approval of Major and Minor modifications to existing programs as defined by the University of Toronto Quality Assurance Process (*UTQAP, Section 3.1*).

**GOVERNANCE PATH:**

**1. UTSC Academic Affairs Committee [For Approval] (January 15, 2019)**

**PREVIOUS ACTION TAKEN:**

No previous action in governance has been taken on this item.

## **HIGHLIGHTS:**

The Department of Computer and Mathematical Sciences (CMS) at the University of Toronto Scarborough (UTSC) is proposing to close streams in Health Informatics in the Specialist/Specialist (Co-operative) programs in Computer Science (BSc).

The overall objective of the Specialist programs is to educate computer scientists and give them a broad perspective of the discipline of computer science. Currently, they are programs with five streams: Comprehensive, Software Engineering, Information Systems, Entrepreneurship and Health Informatics. The objective of the individual streams is to provide exposure to additional subjects.

The streams in Health Informatics were first introduced in the 2013-14 academic year as part of a suite of new offerings designed to respond to growing student interest in the study of human health. The streams were intended to expose students to subjects that would be useful for a career as a computer scientist in the health sector, including more training in statistics than is required in other computer science specialist streams, and some aspects of business management, biomedical ethics, and health policy. However, there has been consistently low student interest in these options. Only one student has graduated from the streams in the past five years, and there is only 1 student, who is in the final year of study, currently enrolled across both offerings.

Following a review of available resources, as well as its academic priorities, the Department has decided to close the streams. The Specialist programs will consequently change from programs with five streams to programs with four streams: Comprehensive, Software Engineering, Information Systems, and Entrepreneurship.

There will be no change to the overarching learning outcomes for the Specialist programs, and there is no impact on the learning outcomes associated with the remaining four streams.

Effective with the 2019-20 Calendar, enrolments in the stream will be suspended, and the streams will be fully closed effective 2020-21.

The one student who is currently enrolled in the Health Informatics stream of the Specialist program in Computer Science is expected to complete the program in the 2018-19 academic year but will be grandfathered if necessary. Course accommodations can be made, where necessary.

Students interested in the study of Computer Science will have many alternative options to choose from, including other streams in the Specialist, as well as Major and Minor offerings in Computer Science. Students interested in the study of Health will also have many alternative options to choose from, including Specialist, Major and Minor programs in Biology, Health Studies, Paramedicine and Mental Health Studies.

The proposed changes have been broadly discussed within the Department of Computer and Mathematical Sciences, and with the Interim Director of the Interdisciplinary Centre for Health and Society. The proposal has been reviewed by the Dean's Office, the Office of the Vice-Provost, Academic Programs, and the UTSC Campus Curriculum Committee.

**FINANCIAL IMPLICATIONS:**

There are no net financial implications to the campus operating budget.

**RECOMMENDATION:**

Be It Resolved,

THAT the major modification to close the streams in Health Informatics in the Specialist/Specialist (Co-operative) in Computer Science (BSc), as described in the proposal dated November 19, 2018 and recommended by the Vice-Principal Academic and Dean, William Gough, be approved effective as of Fall 2019 for the 2019-20 academic year.

**DOCUMENTATION PROVIDED:**

1. Major Modification to the Specialist/Specialist (Co-operative) programs in Computer Science (BSc), dated November 19, 2018.



## **University of Toronto Major Modification Proposal: Closing a Formal Stream in an Existing Undergraduate Program**

<b>Program being modified:</b>	<ul style="list-style-type: none"><li>• Specialist Program in Computer Science (BSc)</li><li>• Specialist (Co-operative) Program in Computer Science (BSc)</li></ul>
<b>Type of Major Modification:</b>	Closure of Health Informatics streams; Sp/Sp Co-op in CS change from programs with five streams to programs with four streams
<b>Effective Date of Change:</b>	Fall 2019
<b>Department / Unit where the program resides:</b>	Computer & Mathematical Sciences
<b>Discipline Area/Calendar Section:</b>	Computer Science
<b>Faculty / Academic Division:</b>	University of Toronto Scarborough
<b>Faculty / Academic Division contact:</b>	Annette Knott, Academic Programs Officer; <a href="mailto:aknott@utsc.utoronto.ca">aknott@utsc.utoronto.ca</a>
<b>Department / Unit contact:</b>	Mike Molloy
<b>Date of this version of the proposal:</b>	November 19, 2018

# 1 Summary

The Specialist and Specialist (Co-operative) programs in Computer Science (BSc), which are housed in the Department of Computer and Mathematical Sciences (CMS), are programs with five streams: Comprehensive, Software Engineering, Information Systems, Entrepreneurship and Health Informatics.

The streams in Health Informatics were introduced to the Specialist programs in the 2013-14 academic year as part of a suite of new offerings designed to respond to growing student interest in the study of human health; however, there has been consistently low student interest in these options, and there is currently only 1 student enrolled. This student, who is in the final year of study, will be grandfathered.

Following a review of available resources, as well as its academic priorities, the Department has decided to close these streams; the Specialist/Specialist (Co-operative) programs will consequently change from programs with five streams each to programs with four streams each. There will be no change to the overarching learning outcomes for the programs, or to the learning outcomes for each of the remaining four streams. Effective with the 2019-20 Calendar, enrolments in the streams will be suspended, and the streams will be fully closed effective 2020-21.

Students interested in the study of Computer Science will have many alternative options to choose from, as do students who are interested in Health.

There will be no impact on faculty in the Department. There also will be no impact on resources.

## 2 Academic Rationale

### 1. Closure of the Health Informatics streams:

The Specialist and Specialist (Co-operative) programs in Computer Science (BSc) currently have five streams: Comprehensive, Software Engineering, Information Systems, Entrepreneurship and Health Informatics.

The streams in Health Informatics were first introduced to the Specialist programs in the 2013-14 academic year as part of a suite of new offerings designed to respond to growing student interest in the study of human health.

The overall objective of the Specialist programs is to educate computer scientists and give them a broad perspective of the discipline of computer science. The objective of the individual streams is to provide exposure to additional subjects. The streams in Health Informatics were intended to expose students to subjects that would be useful for a career as a computer scientist in the health sector, including more training in statistics than is required in other computer science specialist streams, and some aspects of business management, biomedical ethics, and health policy. However, there has been consistently low student interest in these options. A total of one student has graduated from the streams in the past five years, and there is only 1 student, who is in the final year of study, currently enrolled across both offerings.

Following a review of available resources, as well as its academic priorities, the Department has decided to close these streams. The Specialist/Specialist (Co-operative) programs will consequently

change from programs with five streams to programs with four streams: Comprehensive, Software Engineering, Information Systems, and Entrepreneurship. There will be no change to the overarching learning outcomes for the Specialist programs, and there is no impact on the learning outcomes associated with the remaining four streams. Effective with the 2019-20 Calendar, enrolments in the streams will be suspended, and the streams will be fully closed effective 2020-21.

As noted, there is currently one student enrolled across the two streams – in the Specialist program in Computer Science. This student is expected to complete the program in the 2018-19 academic year but will be grandfathered if necessary. Course accommodations can also be made, where necessary.

Students interested in the study of Computer Science will have many alternative options to choose from, including other streams in the Specialist, as well as Major and Minor offerings in Computer Science. Students interested in the study of Health will also have many alternative options to choose from, including Specialist, Major and Minor programs in Biology, Health Studies, Paramedicine and Mental Health Studies.

### **3 Description of the Proposed Major Modification(s)**

#### **Major Modifications:**

1. Closure of the Health Informatics streams of the Specialist and Specialist Co-op programs in Computer Science. Effective with the 2019-20 Calendar, enrolments in the stream will be suspended, and the program will be fully closed effective 2020-21.
2. The Specialist/Specialist (Co-operative) programs in Computer Science will become programs with four streams: Comprehensive, Software Engineering, Information Systems, and Entrepreneurship.
3. The program learning outcomes are unchanged, the learning outcomes for the remaining four streams are unchanged.

### **4 Impact on other programs/units of the proposed closure**

There will be no impact on the Department's programs of study. There will be no impact on other academic units. There are no inter-divisional or inter-institutional agreements/contracts associated with these offerings.

The courses that support the streams in Health Informatics are commonly used in other programs, and will continue to be offered at the discretion of their home units. Where necessary, accommodations can be made if specific courses are no longer available.

### **5 Impact of the Change(s) on Students**

There is only one student enrolled across the two streams – in the Specialist in Computer Science. S/he is in the final year of study, and will be grandfathered and will be able to complete the program; we anticipate this will take place during the 2018/19 academic year.

Students interested in the study of Computer Science will have many alternative options to choose from, including other streams in the Specialist, as well as Major and Minor offerings in Computer Science. Students interested in the study of Health will also have many alternative options to choose from, including Specialist, Major and Minor programs in Biology, Health Studies, Paramedicine and Mental Health Studies.

**Table 1: Undergraduate**

	<b>Year one</b>	<b>Year two</b>	<b>Year three</b>	<b>Year four</b>
<b>Sp CS/Health Informatics</b>	0	0	0	1
<b>Sp Co-op CS/Health Informatics</b>	0	0	0	0

## 6 Faculty / Staff Accommodation

There will be no impact on faculty and staff. The Department of Computer and Mathematical Sciences will continue to offer other programs.

## 7 Consultation

There has been wide consultation within the Department of Computer and Mathematical Sciences, including multiple meetings with faculty and staff. No concerns were raised.

In addition, we have consulted with the Interim Director of the Interdisciplinary Centre for Health and Society, who has no concerns.

## 8 Resources

There will be no impact on resources.

## 9 UTSC Administrative Steps

<b>Administrative Steps Required</b>	<b>Date</b>
<b>Departmental Curriculum Committee</b>	June 22, 2018
<b>Dean's Office Green Light</b>	August 8, 2018
<b>Campus Curriculum Committee</b>	November 29, 2018

## 10 UTQAP/Formal Governance Process

<b>Levels of Approval Required</b>	<b>Date</b>
<ul style="list-style-type: none"> <li>• Decanal Sign-Off</li> <li>• Provost Office Sign-Off</li> </ul>	<ul style="list-style-type: none"> <li>• November 1, 2018</li> <li>• November 12, 2018</li> </ul>
<b>UTSC Academic Affairs Committee</b>	<u>January 15, 2019</u>
<b>Submission to Provost's Office</b>	
<b>AP&amp;P – reported annually</b>	
<b>Ontario Quality Council – reported annually</b>	



## **Appendix A: *Calendar Copy* [showing changes effective Fall 2019\*]**

**\*Minor modifications presented separately to AAC for approval to be effective for Summer 2019 have been incorporated into the following *Calendar copy*. To view these changes see Appendix B.**

### **SPECIALIST PROGRAM IN COMPUTER SCIENCE (SCIENCE)**

Supervisor of Studies: R. Pancer (416-287-7679) Email: pancer@utsc.utoronto.ca

#### **Program Objectives**

This program provides a working knowledge of the foundations of computer science: modern computer software and hardware, theoretical aspects of computer science, and relevant areas of mathematics and statistics. It also imparts an appreciation of the discipline's transformative impact on science and society. The program prepares students for further study and for careers in the computing industry. It comprises ~~four~~ **five** streams with different emphases:

The Comprehensive Stream provides a broad and balanced exposure to the discipline. It is the stream best-suited for students planning to pursue graduate study in computer science, but it is also suitable for other career paths.

The Software Engineering Stream places a greater emphasis on the engineering side of the discipline, including computer systems and core applications.

The Information Systems Stream has a similar focus as the Software Engineering Stream, but it provides additional exposure to certain aspects of business management. It is of special interest to students wishing to pursue careers in technical management but who have a deep interest in the technology.

~~The Health Informatics Stream provides a broad perspective of the discipline and exposure to additional subjects, including statistics and social sciences, that are useful for a career as a computer scientist in the health sector.~~

**The Health Informatics Stream is suspended to new enrolments and will be fully closed effective 2020-21.**

The Entrepreneurship Stream includes a solid core of computer science and software engineering, while exposing students to the framework and methodologies that underlie the development of innovative technology ideas into viable commercial opportunities. Enrolment into the Entrepreneurship stream will be limited to highly qualified and motivated students, and preference will be given to students enrolled in the Specialist (Co-operative) program.

The structure of the program requirements allows one to easily switch streams until relatively late in the program. Consequently, these streams should not be viewed as rigidly separated channels feeding students to different career paths, but as a flexible structure that provides computer science students guidance in their course selection based on their broad (but possibly fluid) interests.

### **Enrolment Requirements**

Enrolment in the Specialist in Computer Science (all streams) is limited. Students may apply to enter the program after completing 4.0 credits, and must have passed all of the A-level CSC and MAT courses required in the program (CSCA08H3, CSCA48H3, CSCA67H3, MATA22H3, MATA31H3, and MATA37H3). Students are admitted on the basis of academic performance in program courses.

Admission to the Entrepreneurship stream also requires the submission of a Supplementary Application Form (SAF) available from the [CMS website](#).

Students who are not admitted as above, and who are enrolled in the Minor in Computer Science, may apply after completing at least 7.5 credits, including the core A-level courses listed above as well as CSCB07H3\*, CSCB09H3\*, CSCB36H3\*, and one of MATB24H3 or STAB52H3. Students are admitted on the basis of academic performance in program courses.

\* These courses have a CS subject POST or minimum CGPA prerequisite.

To remain in the program, a student must maintain a CGPA of 2.0 or higher throughout the program.

### **Program Requirements**

The program requirements comprise a core of 18 courses (9.0 credits), common to all streams and additional requirements which depend on the stream, for a total of 27 courses (13.5 credits) for the Comprehensive, Software Engineering, and Entrepreneurship streams, **and** 29 courses (14.5 credits) for the Information Systems stream, ~~and 30 courses (15.0 credits) for the Health Informatics stream.~~

Note: Many Computer Science courses are offered both at U of T Scarborough and at the St. George campus. When a course is offered at both campuses in a given session, U of T Scarborough students are expected to take that course at U of T Scarborough. The Department of Computer Science at the St. George campus cannot guarantee space for U of T Scarborough students in their courses, especially those offered at both campuses.

## **Core (9.0 credits)**

### 1. Writing Requirement (0.5 credit)\*

0.5 credit from the following: ANTA01H3, ANTA02H3, (CLAA02H3), (CTLA19H3), CTLA01H3, ENGA10H3, ENGA11H3, ENGB06H3, ENGB07H3, ENGB08H3, ENGB09H3, ENGB17H3, ENGB19H3, ENGB50H3, (ENGB51H3), GGRA02H3, GGRA03H3, GGRB05H3, (GGRB06H3), (HISA01H3), (HLTA01H3), ACMA01H3, (HUMA01H3), (HUMA11H3), (HUMA17H3), (LGGA99H3), LINA01H3, PHLA10H3, PHLA11H3, WSTA01H3.

\*Note: It is recommended that this requirement be satisfied by the end of the second year.

### 2. A-level courses (3.0 credits)

CSCA08H3 Introduction to Computer Science I  
CSCA48H3 Introduction to Computer Science II  
CSCA67H3 Discrete Mathematics  
MATA22H3 Linear Algebra I for Mathematical Sciences  
MATA31H3 Calculus I for Mathematical Sciences  
MATA37H3 Calculus II for Mathematical Sciences

### 3. B-level courses (3.5 credits)

CSCB07H3 Software Design  
CSCB09H3 Software Tools and Systems Programming  
CSCB36H3 Introduction to the Theory of Computation  
CSCB58H3 Computer Organization  
CSCB63H3 Design and Analysis of Data Structures  
MATB24H3 Linear Algebra II  
STAB52H3 Introduction to Probability

### 4. C-level courses (1.5 credits)

CSCC43H3 Introduction to Databases  
CSCC69H3 Operating Systems  
CSCC73H3 Algorithm Design and Analysis

### 5. D-level courses (0.5 credit)

CSCD03H3 Social Impact of Information Technology

## **A. Comprehensive Stream**

This stream requires a total of 27 courses (13.5 credits). In addition to the core requirements 1-5 common to all streams, 9 other distinct courses (4.5 credits) must be chosen satisfying all of the following requirements:

### 6. Additional required courses (2.5 credits)

MATB41H3 Techniques of the Calculus of Several Variables I  
CSCC24H3 Principles of Programming Languages  
CSCC37H3 Introduction to Numerical Algorithms for Computational Mathematics  
CSCC63H3 Computability and Computational Complexity

CSCD37H3 Analysis of Numerical Algorithms for Computational Mathematics

7. Electives from courses on computer systems and applications (1.0 credit)

Choose from:

CSCC01H3 Introduction to Software Engineering  
CSCC09H3 Programming on the Web  
CSCC10H3 Human-Computer Interaction  
CSCC11H3 Introduction to Machine Learning and Data Mining  
CSCC46H3 Social and Information Networks  
CSCC85H3 Introduction to Embedded Systems  
CSCD01H3 Engineering Large Software Systems  
CSCD18H3 Computer Graphics  
CSCD27H3 Computer and Network Security  
CSCD43H3 Database System Technology  
CSCD58H3 Computer Networks  
CSCD70H3 Compiler Optimization  
CSCD84H3 Artificial Intelligence  
CSC320H Visual Computing  
CSC321H Introduction to Neural Networks and Machine Learning  
CSC401H Natural Language Computing  
CSC469H Operating Systems Design and Implementation  
CSC485H Computational Linguistics  
CSC488H Compilers and Interpreters

8. Electives from courses related to the theory of computing (0.5 credit)

Choose from:

MATC09H3 Introduction to Mathematical Logic  
MATC32H3 Graph Theory and Algorithms for its Applications  
MATC44H3 Introduction to Combinatorics  
MATD16H3 Coding Theory and Cryptography  
CSC438H Computability and Logic  
CSC448H Formal Languages and Automata  
CSC465H Formal Methods in Software Design

9. CSC, MAT, or STA elective (0.5 credit)

Any C- or D-level CSC, MAT, or STA course, excluding MATC82H3, MATC90H3, and STAD29H3.

### **B. Software Engineering Stream**

This stream requires a total of 27 courses (13.5 credits). In addition to the core requirements 1-5 common to all streams, 9 other distinct courses (4.5 credits) must be chosen satisfying all of the following requirements:

6. Additional required courses (3.0 credits)

MATB41H3 Techniques of the Calculus of Several Variables I  
CSCC01H3 Introduction to Software Engineering

CSCC24H3 Principles of Programming Languages  
CSCC37H3 Introduction to Numerical Algorithms for Computational Mathematics  
CSCC63H3 Computability and Computational Complexity  
CSCD01H3 Engineering Large Software Systems

7. Electives from courses on computer systems and applications (1.5 credits)

Choose from:

CSCC09H3 Programming on the Web  
CSCC10H3 Human-Computer Interaction  
CSCC11H3 Introduction to Machine Learning and Data Mining  
CSCC46H3 Social and Information Networks  
CSCC85H3 Introduction to Embedded Systems  
CSCD18H3 Computer Graphics  
CSCD27H3 Computer and Network Security  
CSCD43H3 Database System Technology  
CSCD58H3 Computer Networks  
CSCD70H3 Compiler Optimization  
CSCD84H3 Artificial Intelligence  
CSC320H Visual Computing  
CSC321H Introduction to Neural Networks and Machine Learning  
CSC401H Natural Language Computing  
CSC469H Operating Systems Design and Implementation  
CSC485H Computational Linguistics  
CSC488H Compilers and Interpreters

### **C. Information Systems Stream**

This stream requires a total of 29 courses (14.5 credits). In addition to the core requirements 1-5 common to all streams, 11 other distinct courses (5.5 credits) must be chosen satisfying all of the following requirements:

6. Required management courses (1.5 credits)

MGTA01H3/(MGTA03H3) Introduction to Business  
MGTA02H3/(MGTA04H3) Managing the Business Organization  
MGHB02H3 Managing People and Groups in Organizations

7. Additional required mathematics and computer science courses (3.0 credits)

MATB41H3 Techniques of the Calculus of Several Variables I  
CSCC01H3 Introduction to Software Engineering  
CSCC37H3 Introduction to Numerical Algorithms for Computational Mathematics  
CSCC63H3 Computability and Computational Complexity  
CSCD01H3 Engineering Large Software Systems  
CSCD43H3 Database System Technology

8. Electives from courses on computer systems and applications (1.0 credit)

Choose from:

CSCC09H3 Programming on the Web

CSCC10H3 Human-Computer Interaction  
CSCC11H3 Introduction to Machine Learning and Data Mining  
CSCC46H3 Social and Information Networks  
CSCC85H3 Introduction to Embedded Systems  
CSCD18H3 Computer Graphics  
CSCD27H3 Computer and Network Security  
CSCD58H3 Computer Networks  
CSCD70H3 Compiler Optimization  
CSCD84H3 Artificial Intelligence  
CSC320H Visual Computing  
CSC321H Introduction to Neural Networks and Machine Learning  
CSC401H Natural Language Computing  
CSC469H Operating Systems Design and Implementation  
CSC485H Computational Linguistics  
CSC488H Compilers and Interpreters

#### ~~D. Health Informatics Stream~~

~~This stream requires a total of 30 courses (15.0 credits). In addition to the core requirements 1-5 common to all streams, 12 other distinct courses (6.0 credits) must be chosen satisfying all of the following requirements:~~

~~6. Additional courses related to health studies (2.0 credits)~~

~~PHLB09H3 Biomedical Ethics  
(MGTA06H3) Introduction to Health Management\*~~

~~and~~

~~0.5 credit from the following: (courses on health policy and politics)~~

~~HLTB16H3 Introduction to Public Health  
(HLTB17H3) Conceptual Models of Health  
HLTB40H3 Health Policy and Health Systems  
(HLTC40H3) Introduction to Health Economics~~

~~and~~

~~0.5 credit from the following: (other courses on health studies)~~

~~HLTB22H3 Biological Determinants of Health  
(HLTC05H3) Society, Health and Illness\*  
(\*). These courses have prerequisites not included in this program's requirements.~~

~~7. Additional required computer science and statistics courses (1.5 credits)~~

~~CSCC01H3 Introduction to Software Engineering  
STAB57H3 Introduction to Statistics  
STAC50H3 Data Collection~~

~~8. Additional CSC, MAT and STA courses (2.5 credits)~~

~~MATB41H3 Techniques of the Calculus of Several Variables I~~

~~2.0 credits in any other C- or D-level CSC or STA courses, excluding STAD29H3 \*\*†~~

~~Note: Of the five courses taken to satisfy this requirement, at least one must be a D-level course, and at least three must be CSC courses.~~

~~\*\* Some C- and D-level CSC and STA courses have prerequisites that are not included among the required courses for this stream. Review the prerequisites carefully before selecting courses for this requirement. One or more courses taken to satisfy this requirement can be prerequisites for other courses also taken to satisfy this requirement.~~

~~† Among the CSC courses that can be used to satisfy this requirement there are two categories of courses that are particularly well aligned with the goals of the Health Informatics stream: software engineering and systems, and computer science applications. Courses in the category of software engineering and systems include: CSCC09H3, CSCC85H3, CSCD01H3, CSCD43H3, and CSCD58H3. Courses in the category of computer science applications include: CSCC11H3, CSCD18H3, and CSCD84H3.~~

### **DE. Entrepreneurship Stream**

This stream requires a total of 27 courses (13.5 credits). In addition to the core requirements 1-5 common to all streams, 9 other distinct courses (4.5 credits) must be chosen satisfying all of the following requirements:

#### 6. Additional required courses (3.0 credits)

CSCC01H3 Introduction to Software Engineering

CSCC37H3 Introduction to Numerical Algorithms for Computational Mathematics

CSCC63H3 Computability and Computational Complexity

CSCD01H3 Engineering Large Software Systems

CSCD54H3 Technology Innovation and Entrepreneurship

CSCD90H3 The Startup Sandbox

#### 7. Electives from courses in computer science, mathematics, and statistics (1.5 credits)

Choose from:

MATB41H3 Techniques of the Calculus of Several Variables I

STAB57H3 Introduction to Statistics

CSCC09H3 Programming on the Web

CSCC10H3 Human-Computer Interaction

CSCC11H3 Introduction to Machine Learning and Data Mining

CSCC24H3 Principles of Programming Languages

CSCC46H3 Social and Information Networks

CSCC85H3 Introduction to Embedded Systems

CSCD18H3 Computer Graphics

CSCD27H3 Computer and Network Security

CSCD43H3 Database System Technology

CSCD58H3 Computer Networks

CSCD70H3 Compiler Optimization

CSCD84H3 Artificial Intelligence

CSC320H Visual Computing

CSC321H Introduction to Neural Networks and Machine Learning

CSC401H Natural Language Computing  
CSC469H Operating Systems Design and Implementation  
CSC485H Computational Linguistics  
CSC488H Compilers and Interpreters



## **SPECIALIST (CO-OPERATIVE) PROGRAM IN COMPUTER SCIENCE (SCIENCE)**

Supervisor of Studies: R. Pancer (416-287-7679) Email: pancer@utsc.utoronto.ca

Co-op Contact: askcoop@utsc.utoronto.ca

This program provides a working knowledge of the foundations of computer science: modern computer software and hardware, theoretical aspects of computer science, and relevant areas of mathematics and statistics. It also imparts an appreciation of the discipline's transformative impact on science and society. The program prepares students for further study and for careers in the computing industry. It comprises ~~four~~ **five** streams with different emphases:

**The Comprehensive Stream** provides a broad and balanced exposure to the discipline. It is the stream best-suited for students planning to pursue graduate study in computer science, but it is also suitable for other career paths.

**The Software Engineering Stream** places a greater emphasis on the engineering side of the discipline, including computer systems and core applications.

**The Information Systems Stream** has a similar focus as the Software Engineering Stream, but it provides additional exposure to certain aspects of business management. It is of special interest to students wishing to pursue careers in technical management but who have a deep interest in the technology.

~~**The Health Informatics Stream** provides a broad perspective of the discipline and exposure to additional subjects, including statistics and social sciences, that are useful for a career as a computer scientist in the health sector.~~

**The Health Informatics Stream is suspended to new enrolments and will be fully closed effective 2020-21.**

**The Entrepreneurship Stream** includes a solid core of computer science and software engineering, while exposing students to the framework and the methodologies that underlie the development of innovative technology ideas into viable commercial opportunities. Enrolment into the Entrepreneurship stream will be limited to highly qualified and motivated students, and preference will be given to students enrolled in the Specialist (Co-op) Program.

The structure of the program requirements allows one to easily switch streams until relatively late in the program. Consequently, these streams should not be viewed as rigidly separated channels feeding students to different career paths, but as a flexible structure that provides computer science students guidance in their course selection based on their broad (but possibly fluid) interests.

### **Enrolment Requirements**

Enrolment in the program is limited.

*Current Co-op Students:*

Students admitted to a Co-op Degree POST in their first year of study must request a Co-op Subject POST on ACORN upon completion of 4.0 credits and must have passed all of the A-level CSC and MAT courses required in the program (CSCA08H3, CSCA48H3, CSCA67H3, MATA22H3, MATA31H3, and MATA37H3). Students are admitted on the basis of academic performance in program courses. In addition, they must also have achieved a CGPA of at least 2.5 across all attempted courses.

Admission to the Entrepreneurship Stream also requires the submission of a Supplementary Application Form available from the CMS website.

Students who are not admitted as above, and who are enrolled in the Minor in Computer Science, may apply after completing at least 7.5 credits, including the core A-level courses listed above as well as CSCB07H3\*, CSCB09H3\*, CSCB36H3\*, and one of MATB24H3 or STAB52H3. Students are admitted on the basis of academic performance in program courses. In addition, they must also have a CGPA of at least 2.5 across all attempted courses.

\*These courses have a CS subject POST or minimum CGPA prerequisite.

*Prospective Co-op Students:* Prospective students (i.e., those not yet admitted to a Co-op Degree POST) must meet the enrolment requirements noted above and have a CGPA of at least 2.75 across all attempted courses.

In addition to requesting the program on ACORN, prospective Co-op students (i.e., those not yet admitted to a Co-op Degree POST) must also submit a Co-op Supplementary Application Form, which is available from the Arts & Science Co-op Office (<http://www.utoronto.ca/askcoop/future-co-op-students>). Submission deadlines follow the Limited Enrolment Program Application Deadlines set by the Office of the Registrar each year. Failure to submit both the Supplementary Application Form and the program request on ACORN will result in that student's application not being considered.

## **Program Requirements**

Students must complete the program requirements as described in the Specialist Program in Computer Science. To remain in the program, students must maintain a CGPA of 2.5 or higher throughout the program. To complete the program, students must meet the work term and course requirements described below.

## **Co-op Work Term Requirements**

Students must satisfactorily complete three Co-op work terms, each of four-months duration, one of which can be during the summer. To be eligible for their first work term, students must be enrolled in the Specialist (Co-operative) Program in Computer Science and have completed at least 7.0 credits, including all first year required courses (CSCA08H3, CSCA48H3, CSCA67H3, MATA22H3, MATA31H3, MATA37H3).

In addition to their academic program requirements, Co-op students complete up to five Co-op specific courses. These courses are designed to prepare students for their job search and work term experience, and to maximize the benefits of their Co-op work terms. They cover a variety of topics intended to assist students in developing the skills and tools required to secure work terms that are appropriate to their program of study, and to perform professionally in the workplace. These courses must be completed in sequence, and are taken in addition to a full course load. They are recorded on transcripts as credit/no credit (CR/NCR) and are considered to be additive credit to the 20.0 required degree credits. No additional course fee is assessed as registration is included in the Co-op Program fee.

### **Co-op Preparation Course Requirements:**

1. COPD01H3 – Foundations for Success in Arts & Science Co-op
  - Students entering Co-op from outside of UTSC (high school or other postsecondary) will complete this course in fall of their first year at UTSC
  - Current UTSC students entering Co-op in April/May will complete this course in the summer term
  - Current UTSC students entering Co-op in July/August will complete this course in the fall term
2. COPD03H3 – Preparing to Compete for your Co-op Work Term
  - Prerequisite: COPD01H3
  - This course will be completed eight months in advance of the first scheduled work term
3. COPD11H3 – Managing your Work Term Search & Transition to Work
  - Prerequisite: COPD03H3
  - This course will be completed four months in advance of the first work scheduled work term
4. COPD12H3 – Integrating Your Work Term Experience Part I
  - Prerequisite: COPD11H3 and one Co-op work term
  - This course will be completed four months in advance of the second scheduled work term
5. COPD13H3 – Integrating Your Work Term Experience Part II
  - Prerequisite: COPD12H3 and two Co-op work terms
  - This course will be completed four months in advance of the third scheduled work term

## **Appendix B: Calendar Copy [showing changes effective Summer 2019]**

### **SPECIALIST PROGRAM IN COMPUTER SCIENCE (SCIENCE)**

Supervisor of Studies: R. Pancer (416-287-7679) Email: pancer@utsc.utoronto.ca

#### **Program Objectives**

This program provides a working knowledge of the foundations of computer science: modern computer software and hardware, theoretical aspects of computer science, and relevant areas of mathematics and statistics. It also imparts an appreciation of the discipline's transformative impact on science and society. The program prepares students for further study and for careers in the computing industry. It comprises five streams with different emphases:

The Comprehensive Stream provides a broad and balanced exposure to the discipline. It is the stream best-suited for students planning to pursue graduate study in computer science, but it is also suitable for other career paths.

The Software Engineering Stream places a greater emphasis on the engineering side of the discipline, including computer systems and core applications.

The Information Systems Stream has a similar focus as the Software Engineering Stream, but it provides additional exposure to certain aspects of business management. It is of special interest to students wishing to pursue careers in technical management but who have a deep interest in the technology.

The Health Informatics Stream provides a broad perspective of the discipline and exposure to additional subjects, including statistics and social sciences, that are useful for a career as a computer scientist in the health sector.

The Entrepreneurship Stream includes a solid core of computer science and software engineering, while exposing students to the framework and methodologies that underlie the development of innovative technology ideas into viable commercial opportunities. Enrolment into the Entrepreneurship stream will be limited to highly qualified and motivated students, and preference will be given to students enrolled in the Specialist (Co-operative) program.

The structure of the program requirements allows one to easily switch streams until relatively late in the program. Consequently, these streams should not be viewed as rigidly separated channels feeding students to different career paths, but as a flexible structure that provides computer science students guidance in their course selection based on their broad (but possibly fluid) interests.

## Enrolment Requirements

Enrolment in the Specialist in Computer Science (all streams) is limited. Students may apply to enter the program after completing 4.0 credits, and must have passed all of the A-level CSC and MAT courses required in the program ([CSCA08H3](#), [CSCA48H3](#), [CSCA67H3](#), [MATA22H3](#), [MATA31H3](#), and [MATA37H3](#)). **Students are admitted on the basis of academic performance in program courses.** ~~Students with a CGPA of at least 3.0 across the core A-level courses ([CSCA08H3](#), [CSCA48H3](#), [CSCA67H3](#), [MATA22H3](#), [MATA31H3](#), and [MATA37H3](#)) are guaranteed admission.~~

Admission to the Entrepreneurship stream also requires the submission of a Supplementary Application Form (SAF) available from the [CMS website](#).

Students who are not admitted as above, **and who are enrolled in the Minor in Computer Science**, may apply after completing at least 7.5 credits, including the core A-level courses listed above as well as [CSCB07H3\\*](#), [CSCB09H3\\*](#), [CSCB36H3\\*](#), [CSCB63H3](#), and one of [MATB24H3](#) or [STAB52H3](#). **Students are admitted on the basis of academic performance in program courses.** ~~Students with a CGPA of at least 3.0 across the B-level courses in the above list ([CSCB07H3\\*](#), [CSCB09H3\\*](#), [CSCB36H3\\*](#), [CSCB63H3\\*](#), and the best of [MATB24H3](#) or [STAB52H3](#)) are guaranteed admission.~~

\* These courses have a CS subject POST or minimum CGPA prerequisite.

To remain in the program, a student must maintain a CGPA of 2.0 or higher throughout the program.

## Program Requirements

The program requirements comprise a core of 18 courses (9.0 credits), common to all streams and additional requirements which depend on the stream, for a total of 27 courses (13.5 credits) for the Comprehensive, Software Engineering, and Entrepreneurship streams, 29 courses (14.5 credits) for the Information Systems stream, and 30 courses (15.0 credits) for the Health Informatics stream.

Note: Many Computer Science courses are offered both at U of T Scarborough and at the St. George campus. When a course is offered at both campuses in a given session, U of T Scarborough students are expected to take that course at U of T Scarborough. The Department of Computer Science at the St. George campus cannot guarantee space for U of T Scarborough students in their courses, especially those offered at both campuses.

## **Core (9.0 credits)**

### 1. Writing Requirement (0.5 credit)\*

0.5 credit from the following: ANTA01H3, ANTA02H3, (CLAA02H3), (CTLA19H3), CTLA01H3, ENGA10H3, ENGA11H3, ENGB06H3, ENGB07H3, ENGB08H3, ENGB09H3, ENGB17H3, ENGB19H3, ENGB50H3, (ENGB51H3), GGRA02H3, GGRA03H3, GGRB05H3, (GGRB06H3), (HISA01H3), (HLTA01H3), ACMA01H3, (HUMA01H3), (HUMA11H3), (HUMA17H3), (LGGA99H3), LINA01H3, PHLA10H3, PHLA11H3, WSTA01H3.

\*Note: It is recommended that this requirement be satisfied by the end of the second year.

### 2. A-level courses (3.0 credits)

CSCA08H3 Introduction to Computer Science I  
CSCA48H3 Introduction to Computer Science II  
CSCA67H3 Discrete Mathematics  
MATA22H3 Linear Algebra I for Mathematical Sciences  
MATA31H3 Calculus I for Mathematical Sciences  
MATA37H3 Calculus II for Mathematical Sciences

### 3. B-level courses (3.5 credits)

CSCB07H3 Software Design  
CSCB09H3 Software Tools and Systems Programming  
CSCB36H3 Introduction to the Theory of Computation  
CSCB58H3 Computer Organization  
CSCB63H3 Design and Analysis of Data Structures  
MATB24H3 Linear Algebra II  
STAB52H3 Introduction to Probability

### 4. C-level courses (1.5 credits)

CSCC43H3 Introduction to Databases  
CSCC69H3 Operating Systems  
CSCC73H3 Algorithm Design and Analysis

### 5. D-level courses (0.5 credit)

CSCD03H3 Social Impact of Information Technology

## **A. Comprehensive Stream**

This stream requires a total of 27 courses (13.5 credits). In addition to the core requirements 1-5 common to all streams, 9 other distinct courses (4.5 credits) must be chosen satisfying all of the following requirements:

### 6. Additional required courses (2.5 credits)

MATB41H3 Techniques of the Calculus of Several Variables I  
CSCC24H3 Principles of Programming Languages  
CSCC37H3 Introduction to Numerical Algorithms for Computational Mathematics  
CSCC63H3 Computability and Computational Complexity

CSCD37H3 Analysis of Numerical Algorithms for Computational Mathematics

7. Electives from courses on computer systems and applications (1.0 credit)

Choose from:

CSCC01H3 Introduction to Software Engineering  
CSCC09H3 Programming on the Web  
CSCC10H3 Human-Computer Interaction  
CSCC11H3 Introduction to Machine Learning and Data Mining  
CSCC46H3 Social and Information Networks  
CSCC85H3 Introduction to Embedded Systems  
CSCD01H3 Engineering Large Software Systems  
CSCD18H3 Computer Graphics  
CSCD27H3 Computer and Network Security  
CSCD43H3 Database System Technology  
CSCD58H3 Computer Networks  
**CSCD70H3 Compiler Optimization**  
CSCD84H3 Artificial Intelligence  
CSC320H Visual Computing  
CSC321H Introduction to Neural Networks and Machine Learning  
CSC401H Natural Language Computing  
CSC469H Operating Systems Design and Implementation  
CSC485H Computational Linguistics  
CSC488H Compilers and Interpreters

8. Electives from courses related to the theory of computing (0.5 credit)

Choose from:

MATC09H3 Introduction to Mathematical Logic  
MATC32H3 Graph Theory and Algorithms for its Applications  
MATC44H3 Introduction to Combinatorics  
MATD16H3 Coding Theory and Cryptography  
CSC438H Computability and Logic  
CSC448H Formal Languages and Automata  
CSC465H Formal Methods in Software Design

9. CSC, MAT, or STA elective (0.5 credit)

Any C- or D-level CSC, MAT, or STA course, excluding MATC82H3, MATC90H3, and STAD29H3.

### **B. Software Engineering Stream**

This stream requires a total of 27 courses (13.5 credits). In addition to the core requirements 1-5 common to all streams, 9 other distinct courses (4.5 credits) must be chosen satisfying all of the following requirements:

6. Additional required courses (3.0 credits)

MATB41H3 Techniques of the Calculus of Several Variables I  
CSCC01H3 Introduction to Software Engineering

CSCC24H3 Principles of Programming Languages  
CSCC37H3 Introduction to Numerical Algorithms for Computational Mathematics  
CSCC63H3 Computability and Computational Complexity  
CSCD01H3 Engineering Large Software Systems

7. Electives from courses on computer systems and applications (1.5 credits)

Choose from:

CSCC09H3 Programming on the Web  
CSCC10H3 Human-Computer Interaction  
CSCC11H3 Introduction to Machine Learning and Data Mining  
CSCC46H3 Social and Information Networks  
CSCC85H3 Introduction to Embedded Systems  
CSCD18H3 Computer Graphics  
CSCD27H3 Computer and Network Security  
CSCD43H3 Database System Technology  
CSCD58H3 Computer Networks  
**CSCD70H3 Compiler Optimization**  
CSCD84H3 Artificial Intelligence  
CSC320H Visual Computing  
CSC321H Introduction to Neural Networks and Machine Learning  
CSC401H Natural Language Computing  
CSC469H Operating Systems Design and Implementation  
CSC485H Computational Linguistics  
CSC488H Compilers and Interpreters

### **C. Information Systems Stream**

This stream requires a total of 29 courses (14.5 credits). In addition to the core requirements 1-5 common to all streams, 11 other distinct courses (5.5 credits) must be chosen satisfying all of the following requirements:

6. Required management courses (1.5 credits)

MGTA01H3/(MGTA03H3) Introduction to Business  
MGTA02H3/(MGTA04H3) Managing the Business Organization  
MGHB02H3 Managing People and Groups in Organizations

7. Additional required mathematics and computer science courses (3.0 credits)

MATB41H3 Techniques of the Calculus of Several Variables I  
CSCC01H3 Introduction to Software Engineering  
CSCC37H3 Introduction to Numerical Algorithms for Computational Mathematics  
CSCC63H3 Computability and Computational Complexity  
CSCD01H3 Engineering Large Software Systems  
CSCD43H3 Database System Technology

8. Electives from courses on computer systems and applications (1.0 credit)

Choose from:

CSCC09H3 Programming on the Web



CSCC10H3 Human-Computer Interaction  
CSCC11H3 Introduction to Machine Learning and Data Mining  
CSCC46H3 Social and Information Networks  
CSCC85H3 Introduction to Embedded Systems  
CSCD18H3 Computer Graphics  
CSCD27H3 Computer and Network Security  
CSCD58H3 Computer Networks  
**CSCD70H3 Compiler Optimization**  
CSCD84H3 Artificial Intelligence  
CSC320H Visual Computing  
CSC321H Introduction to Neural Networks and Machine Learning  
CSC401H Natural Language Computing  
CSC469H Operating Systems Design and Implementation  
CSC485H Computational Linguistics  
CSC488H Compilers and Interpreters

#### D. Health Informatics Stream

This stream requires a total of 30 courses (15.0 credits). In addition to the core requirements 1-5 common to all streams, 12 other distinct courses (6.0 credits) must be chosen satisfying all of the following requirements:

#### 6. Additional courses related to health studies (2.0 credits)

PHLB09H3 Biomedical Ethics  
(MGTA06H3) Introduction to Health Management\*

and

#### 0.5 credit from the following:(courses on health policy and politics)

HLTB16H3 Introduction to Public Health  
(HLTB17H3) Conceptual Models of Health  
HLTB40H3 Health Policy and Health Systems  
(HLTC40H3) Introduction to Health Economics

and

#### 0.5 credit from the following: (other courses on health studies)

HLTB22H3 Biological Determinants of Health  
(HLTC05H3) Society, Health and Illness\*  
(\* ) These courses have prerequisites not included in this program's requirements.

#### 7. Additional required computer science and statistics courses (1.5 credits)

CSCC01H3 Introduction to Software Engineering  
STAB57H3 Introduction to Statistics  
STAC50H3 Data Collection

#### 8. Additional CSC, MAT and STA courses (2.5 credits)

MATB41H3 Techniques of the Calculus of Several Variables I

2.0 credits in any other C- or D-level CSC or STA courses, excluding STAD29H3 \*\*†

Note: Of the five courses taken to satisfy this requirement, at least one must be a D-level course, and at least three must be CSC courses.

\*\* Some C- and D-level CSC and STA courses have prerequisites that are not included among the required courses for this stream. Review the prerequisites carefully before selecting courses for this requirement. One or more courses taken to satisfy this requirement can be prerequisites for other courses also taken to satisfy this requirement.

† Among the CSC courses that can be used to satisfy this requirement there are two categories of courses that are particularly well aligned with the goals of the Health Informatics stream: software engineering and systems, and computer science applications. Courses in the category of software engineering and systems include: CSCC09H3, CSCC85H3, CSCD01H3, CSCD43H3, and CSCD58H3. Courses in the category of computer science applications include: CSCC11H3, CSCD18H3, and CSCD84H3.

### **E. Entrepreneurship Stream**

This stream requires a total of 27 courses (13.5 credits). In addition to the core requirements 1-5 common to all streams, 9 other distinct courses (4.5 credits) must be chosen satisfying all of the following requirements:

6. Additional required courses (3.0 credits)

CSCC01H3 Introduction to Software Engineering

CSCC37H3 Introduction to Numerical Algorithms for Computational Mathematics

CSCC63H3 Computability and Computational Complexity

CSCD01H3 Engineering Large Software Systems

CSCD54H3 Technology Innovation and Entrepreneurship

CSCD90H3 The Startup Sandbox

7. Electives from courses in computer science, mathematics, and statistics (1.5 credits)

Choose from:

MATB41H3 Techniques of the Calculus of Several Variables I

STAB57H3 Introduction to Statistics

CSCC09H3 Programming on the Web

CSCC10H3 Human-Computer Interaction

CSCC11H3 Introduction to Machine Learning and Data Mining

CSCC24H3 Principles of Programming Languages

CSCC46H3 Social and Information Networks

CSCC85H3 Introduction to Embedded Systems

CSCD18H3 Computer Graphics

CSCD27H3 Computer and Network Security

CSCD43H3 Database System Technology

CSCD58H3 Computer Networks

**CSCD70H3 Compiler Optimization**

CSCD84H3 Artificial Intelligence

CSC320H Visual Computing

CSC321H Introduction to Neural Networks and Machine Learning

CSC401H Natural Language Computing  
CSC469H Operating Systems Design and Implementation  
CSC485H Computational Linguistics  
CSC488H Compilers and Interpreters

## **SPECIALIST (CO-OPERATIVE) PROGRAM IN COMPUTER SCIENCE (SCIENCE)**

Supervisor of Studies: R. Pancer (416-287-7679) Email: [pancer@utsc.utoronto.ca](mailto:pancer@utsc.utoronto.ca)  
Co-op Contact: [askcoop@utsc.utoronto.ca](mailto:askcoop@utsc.utoronto.ca)

This program provides a working knowledge of the foundations of computer science: modern computer software and hardware, theoretical aspects of computer science, and relevant areas of mathematics and statistics. It also imparts an appreciation of the discipline's transformative impact on science and society. The program prepares students for further study and for careers in the computing industry. It comprises five streams with different emphases:

**The Comprehensive Stream** provides a broad and balanced exposure to the discipline. It is the stream best-suited for students planning to pursue graduate study in computer science, but it is also suitable for other career paths.

**The Software Engineering Stream** places a greater emphasis on the engineering side of the discipline, including computer systems and core applications.

**The Information Systems Stream** has a similar focus as the Software Engineering Stream, but it provides additional exposure to certain aspects of business management. It is of special interest to students wishing to pursue careers in technical management but who have a deep interest in the technology.

**The Health Informatics Stream** provides a broad perspective of the discipline and exposure to additional subjects, including statistics and social sciences, that are useful for a career as a computer scientist in the health sector.

**The Entrepreneurship Stream** includes a solid core of computer science and software engineering, while exposing students to the framework and the methodologies that underlie the development of innovative technology ideas into viable commercial opportunities. Enrolment into the Entrepreneurship stream will be limited to highly qualified and motivated students, and preference will be given to students enrolled in the Specialist (Co-op) Program.

The structure of the program requirements allows one to easily switch streams until relatively late in the program. Consequently, these streams should not be viewed as rigidly separated channels feeding students to different career paths, but as a flexible structure that provides computer science students guidance in their course selection based on their broad (but possibly fluid) interests.

## Enrolment Requirements

Enrolment in the program is limited.

### *Current Co-op Students:*

Students admitted to a Co-op Degree POST in their first year of study must request a Co-op Subject POST on ACORN upon completion of 4.0 credits and must have passed all of the A-level CSC and MAT courses required in the program ([CSCA08H3](#), [CSCA48H3](#), [CSCA67H3](#), [MATA22H3](#), [MATA31H3](#), and [MATA37H3](#)). Students are admitted on the basis of academic performance in program courses. In addition, they must also have achieved a CGPA of at least 2.5 across all attempted courses. ~~Students with a CGPA of at least 3.0 across the core A-level courses ([CSCA08H3](#), [CSCA48H3](#), [CSCA67H3](#), [MATA22H3](#), [MATA31H3](#), and [MATA37H3](#)), as well as a CGPA of at least 2.50 across all attempted courses, are guaranteed admission.~~

Admission to the Entrepreneurship Stream also requires the submission of a Supplementary Application Form available from the CMS website.

Students who are not admitted as above, **and who are enrolled in the Minor in Computer Science**, may apply after completing at least 7.5 credits, including the core A-level courses listed above as well as [CSCB07H3](#)\*, [CSCB09H3](#)\*, [CSCB36H3](#)\*, ~~[CSCB63H3](#)~~ and one of [MATB24H3](#) or [STAB52H3](#). **Students are admitted on the basis of academic performance in program courses. In addition, they must also have a CGPA of at least 2.5 across all attempted courses.** ~~Students with a CGPA of at least 3.0 across the B-level courses in the above list ([CSCB07H3](#)\*, [CSCB09H3](#)\*, [CSCB36H3](#)\*, [CSCB63H3](#)\*, and the best of [MATB24H3](#) or [STAB52H3](#)), as well as a CGPA of at least 2.5 across all attempted courses, are guaranteed admission.~~

\*These courses have a CS subject POST or minimum CGPA prerequisite.

*Prospective Co-op Students:* Prospective students (i.e., those not yet admitted to a Co-op Degree POST) must meet the enrolment requirements noted above and have a CGPA of at least 2.75 across all attempted courses.

In addition to requesting the program on ACORN, prospective Co-op students (i.e., those not yet admitted to a Co-op Degree POST) must also submit a Co-op Supplementary Application Form, which is available from the Arts & Science Co-op Office (<http://www.utoronto.ca/askcoop/future-co-op-students>). Submission deadlines follow the Limited Enrolment Program Application Deadlines set by the Office of the Registrar each year. Failure to submit both the Supplementary Application Form and the program request on ACORN will result in that student's application not being considered.

## Program Requirements

Students must complete the program requirements as described in the Specialist Program in Computer Science. To remain in the program, students must maintain a CGPA of 2.5 or higher throughout the program. To complete the program, students must meet the work term and course requirements described below.

## **Co-op Work Term Requirements**

Students must satisfactorily complete three Co-op work terms, each of four-months duration, one of which can be during the summer. To be eligible for their first work term, students must be enrolled in the Specialist (Co-operative) Program in Computer Science and have completed at least 7.0 credits, including all first year required courses (CSCA08H3, CSCA48H3, CSCA67H3, MATA22H3, MATA31H3, MATA37H3).

In addition to their academic program requirements, Co-op students complete up to five Co-op specific courses. These courses are designed to prepare students for their job search and work term experience, and to maximize the benefits of their Co-op work terms. They cover a variety of topics intended to assist students in developing the skills and tools required to secure work terms that are appropriate to their program of study, and to perform professionally in the workplace. These courses must be completed in sequence, and are taken in addition to a full course load. They are recorded on transcripts as credit/no credit (CR/NCR) and are considered to be additive credit to the 20.0 required degree credits. No additional course fee is assessed as registration is included in the Co-op Program fee.

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  - Prerequisite: COPD01H3
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4. COPD12H3 – Integrating Your Work Term Experience Part I
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