



FOR INFORMATION

PUBLIC

OPEN SESSION

TO: UTSC Academic Affairs Committee

SPONSOR: Prof. William Gough, Vice-Principal Academic and Dean
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PRESENTER: Prof. Mark Schmuckler, Vice-Dean Undergraduate
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DATE: Wednesday, June 14, 2017

AGENDA ITEM: 5

ITEM IDENTIFICATION:

Minor Undergraduate Curricular Modifications (for information)

JURISDICTIONAL INFORMATION:

University of Toronto Scarborough Academic Affairs Committee (AAC) “is concerned with matters affecting the teaching, learning and research functions of the Campus (AAC *Terms of Reference, Section 4*).” Under section 5.7 of its Terms of Reference, the Committee “receives annually from its assessors, reports on matters within its areas of responsibility.”

GOVERNANCE PATH:

1. UTSC Academic Affairs Committee [For Information] (June 14, 2017)

PREVIOUS ACTION TAKEN:

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

HIGHLIGHTS:

The Office of the Vice-Principal Academic and Dean reports, for information, all curricular changes that do not impact program and course learning outcomes or mode of delivery. These include, but are not limited to:

- Adding, deleting or moving an optional course in a program;
- Adding, deleting or moving a required course in a program, as long the change does not alter the nature of the program;

- All course deletions; and
- Changes to existing courses, including: title and/or description, level and/or designator, prerequisites, enrolment limits, and breadth requirement category.

Undergraduate Minor Curriculum Modifications for Information, Report 5 includes changes submitted by:

- The Department of Computer and Mathematical Sciences
 - 1 program change
- The Department of Management
 - 1 course change

FINANCIAL IMPLICATIONS:

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

RECOMMENDATION:

Presented for information.

DOCUMENTATION PROVIDED:

1. 2017-18 Curriculum Cycle: Undergraduate Minor Curriculum Modifications for Information Report 5, dated May 19, 2017.



2017-18 Curriculum Cycle

Undergraduate Minor Curriculum Modifications for Information

Report 5

May 19, 2017

Department of Computer and Mathematical Sciences

Note regarding consultation:

All changes have been approved by the Departmental Curriculum Committee, and reviewed by the Dean's Office. Where changes may have had an impact on outside academic units, appropriate consultation has taken place.

Program Changes

Specialist Program in Computer Science (BSc)

Specialist (Co-operative) Program in Computer Science (BSc)

Overview of Changes:

1. Remove MATA23H3 from component 2 of the Program Requirements

Rationale:

The Department of Computer and Mathematical Sciences submitted a proposal to replace MATA23H3 with MATA22H3 in the 2017-18 curriculum cycle, which was approved by Academic Affairs Committee on February 28, 2017. The original proposed calendar copy showed the addition of MATA22 but not the deletion of MATA23. The identified changes correct this oversight in the original proposal. This has already been implemented for the 2017-18 academic year.

Calendar Copy Showing Changes:

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. Students with a CGPA of 2.75 or greater 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, may apply after completing at least 7.5 credits, including CSCA08H3, CSCA48H3, CSCA67H3, MATA22H3, MATA31H3, MATA37H3, CSCB07H3, CSCB09H3, CSCB36H3, CSCB63H3, and [one of MATB24H3 or STAB52H3]. The CGPA will be calculated across these 11 courses, and a CGPA of 2.75 or greater guarantees admission to the Specialist. Admission for students with a CGPA that is less than 2.75 will depend on their CGPA, and the space available in the program.

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) (*)

One of: 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. (*) 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
MATA23H3 Linear Algebra I
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
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
MATC16H3 Coding Theory and Cryptography
MATC32H3 Graph Theory and Algorithms for its Applications
MATC44H3 Introduction to Combinatorics
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
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
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*

One of: (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

One of: (other courses on health studies)

- HLTB22H3 Biological Determinants of Health

- HLTC05H3 Society, Health and Illness*

(*) These courses have prerequisites not included in this programs 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
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 five streams with different emphases:

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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.

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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. Students with a cumulative GPA of 2.75 or greater across the core A-level courses (CSCA08H3, CSCA48H3, CSCA67H3, MATA22H3, MATA31H3, and MATA37H3), as well as a cumulative GPA 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, may apply after completing at least 7.5 credits, including CSCA08H3, CSCA48H3, CSCA67H3, MATA22H3, MATA31H3, MATA37H3, CSCB07H3, CSCB09H3, CSCB36H3, CSCB63H3 and [one of MATB24H3 or STAB52H3]. Students with a cumulative GPA of 2.75 or greater across these required courses, as well as a cumulative GPA of at least 2.5 across all attempted courses, are guaranteed admission.

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 cumulative GPA 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 Registrar's Office 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 cumulative GPA 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 Navigating the World of Work
 - 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 Job Search Preparation
 - Prerequisite: COPD01H3
 - This course will be completed eight months in advance of the first scheduled work term

Department of Management

Note regarding consultation:

All changes have been approved by the Departmental Curriculum Committee, and reviewed by the Dean's Office. Where changes may have had an impact on outside academic units, appropriate consultation has taken place.

Course Changes

Calendar Copy Showing Changes:

MGTA01H3 Introduction to Business

~~This course serves as an introduction to the process of management, including planning, organizing and the role of management within the broader business community.~~

This course serves as an introduction to organizations called businesses. The course looks at how businesses are planned, organized and created, and the important role that businesses play within the Canadian economic system.

Exclusion: MGTA05H3, (MGTA03H3), (COM110H), MGM101H, RSM100Y

Breadth Requirement: Social & Behavioural Sciences

Rationale:

The revised description more accurately describes the course.