



## ACADEMIC COUNCIL REPORT

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### ACTION REQUESTED:

Recommendation	<input type="checkbox"/>
Decision	<input type="checkbox"/>
Discussion/Direction	<input type="checkbox"/>
Information	<input checked="" type="checkbox"/>

**DATE:** 26 March 2019

**PRESENTED BY:** Langis Roy, Chair, Graduate Studies Committee

**SUBJECT:** Minor Program Adjustment – MSc and PhD in Computer Science

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### COMMITTEE MANDATE:

The Graduate Studies Committee (GSC) reviewed and approved this proposal in accordance with Section 3, Part B-2 of the University's Institutional Quality Assurance Process (Quality Assurance Handbook).

*The outcomes of the review are hereby being reported to Academic Council for information.*

### BACKGROUND/CONTEXT & RATIONALE:

The Computer Science (CS) graduate program description currently allows only a preapproved list of non-CSCI courses to be taken by students. As other Faculties add new graduate courses every year, having a pre-approved list requires that any update requires approvals of the CS graduate curriculum committee as well as the Faculty Councils of FEAS, FSCI and FBIT, which can be time-consuming. The program has proposed that students be permitted to take up to two graduate-level courses from other UOIT graduate programs, subject to approval. This change brings the CS grad program in line with UOIT graduate policies, and provide more options and flexibility to the students. In order to maintain quality control and guarantee that CS graduate students take at least 50% of their courses from CSCI, this proposal limits the number of out-of-program courses to two courses maximum. Also, as per SGPS regulations, registering in an out-of-program course requires the signatures of the student' supervisor, CS Graduate program Director and the Graduate Program Director of the Faculty where the course is being offered, thus allowing multiple reviews of the request with regard to quality and relevance.

Additionally, CSCI 5350G, is being moved from the networking and security area to software design area, after discussion with the instructor revealed that this course had been originally misidentified. A new course, CSCI 5760G, is also being added to the Information Science area course list.

**RESOURCES REQUIRED:**

No additional resources are required.

**CONSULTATION AND APPROVAL:**

Graduate Studies Committee - February 2019

Faculty Council – FEAS: February 2019

Faculty Councils – FBIT and FSc: November 2018

CS Graduate Curriculum Committee: November 2018

**NEXT STEPS:**

- This change will be included in the 2019-2020 Graduate Academic Calendar
- The expected date of implementation is the Fall semester of 2019.

**SUPPORTING REFERENCE MATERIALS:**

- Minor Program Adjustment Proposal
- New Course Proposal

## Course listing

\*2019-2020 - GR - Minor Program Adjustment

### (A) Proposal summary

Home faculty\*

Faculty of Science

Summary of proposed changes\*

The proposed changes include the following:

- Under the list of courses, the section entitled “courses from other programs” will be removed.
- The following statement is added:

“M.Sc. Students are allowed to take up to two graduate-level courses from other UOIT graduate programs, subject to written approval of their supervisor, Computer Science Graduate Program Director and the Graduate Program Director of the host faculty for the course.”

- The following statement is added:

“Ph.D. students are normally expected to take 50% or more of their course load from Computer Science graduate courses. Any exemption in special cases must be approved by the student’s supervisory committee and the Graduate Program Director. “

- CSCI 5350G (Pervasive and Mobile Computing) is moved from the networking and security area to software design area.
- The new CSCI5760G course is added to the Information Science area course list (new course proposal attached).

Is a new course associated with this proposal?\*

Yes

No

Effective semester\*

Fall 2019

Are you attaching any supporting documents?\*

Yes

No

### (B) Program information

**Program or shared  
core name\*** Course listing

**Program type**

**Degree type**

**Program or shared  
core description**

**Calendar copy\***

### General courses

**CSCI 5001G MSc Thesis**

[Right] \*

**CSCI 5010G Survey of Computer Science  
Research Topics and Methods**

**CSCI 5020G Collaborative Design and  
Research**

**CSCI 5030G Automata and Applications**

**CSCI 6001G PhD Dissertation**

[Right] \*\*

**CSCI 7010G PhD Thesis Proposal and  
Candidacy Exam**

[Right] \*\*

### Software Design courses

**CSCI 5100G Development of Concurrent  
Software**

**CSCI 5110G Network Computing**

**CSCI 5120G Principles of Distributed  
Computing**

**CSCI 5130G Programming Language  
Implementation**

**CSCI 5140G Ecology of Online Learning**

**CSCI 5150G Evolution or Revolution:  
Informatics Design Principles**

**CSCI 5160G Topics in Software Design**

**CSCI 5350G Pervasive and Mobile  
Computing**

**CSCI 6100G Advanced Topics in  
Software Design**

**CSCI 6110G Software Modelling  
Techniques and Languages for Industry  
Applications**

**CSCI 6120G Empirical Software Engineering**

## **Networks and IT Security courses**

**CSCI 5300G Computer Communication Networks**

**CSCI 5310G Cryptography and Secure Communications**

**CSCI 5330G Network Optimization**

**CSCI 5340G Performance Evaluation of Computer Networks**

~~**CSCI 5350G Pervasive and Mobile Computing**~~

**CSCI 5360G Topics in Networks**

**CSCI 5370G Topics in IT Security**

**CSCI 6310G Advanced Topics in Networks**

**CSCI 6320G Advanced Topics in IT Security**

**CSCI 6330G Network Modeling and Simulation**

## **Digital Media courses**

**CSCI 5500G Auditory Perception and Virtual Audio**

**CSCI 5510G Computer Graphics**

**CSCI 5520G Computer Vision**

**CSCI 5530G Serious Game Development**

**CSCI 5540G User Interface Technology**

**CSCI 5550G Topics in Digital Media**

**CSCI 5750G Information Visualization**

**CSCI 6515G 3D Imaging from Local Illumination to Holography**

**CSCI 6520G Advanced Topics in Digital Media**

## **Information Science courses**

**CSCI 5700G Introduction to Services Computing**

**CSCI 5710G Services Computing Security**

**CSCI 5720G Topics in Health Informatics**

**CSCI 5730G Topics in Information Science**  
**CSCI 5740G Intelligent Systems**  
**CSCI 5750G Information Visualization**  
**CSCI 5760G Information and Social Networks: Theory and Application**  
**CSCI 6700G Advanced Information Management**  
**CSCI 6710G Advanced Topics in Health Informatics**  
**CSCI 6720G Advanced Topics in Information Science**

**~~The following courses from other UOIT graduate programs may be selected by students in the MSc and PhD in Computer Science:~~**

~~**MCSC 6020G Numerical Analysis**~~

~~**[Right] 1**~~

~~**MCSC 6030G High-Performance Computing**~~

~~**[Right] 1**~~

~~**MCSC 6230G Advanced Topics in High-Performance Computing**~~

~~**[Right] 1**~~

~~**ENGR 5775G Knowledge Discovery and Data Mining**~~

~~**[Right] 2**~~

~~**ENGR 5910G Embedded Real-Time Control Systems**~~

~~**[Right] 2**~~

~~**ENGR 5940G Intelligent Control Systems**~~

~~**[Right] 2**~~

~~**HLSC 5050G Patient Journey Modelling**~~

~~**[Right] 3**~~

~~**HLSC 5203G Adoption, Use and Impact of Health Informatics Systems**~~

~~**[Right] 3**~~

~~**HLSC 5290G Advanced Topics in Patient Journey Modelling**~~

~~**[Right] 3**~~

~~**MITS 5100G Law & Ethics of IT Security**~~

~~**[Right] 4**~~

**Note:**

~~\* Master's program only~~

~~\*\* PhD program only~~

~~<sup>1</sup> MSc in Modelling and Computational Science~~

~~<sup>2</sup> Master of Applied Science in Electrical and Computer Engineering~~

~~<sup>3</sup> Master of Health Sciences – field in Health Informatics~~

~~<sup>4</sup> Master of Information Technology Security~~

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### ~~New Core Non-CSCI Graduate courses~~

~~M. Sc. Students are allowed to take up to two graduate-level courses from other UOIT graduate programs, subject to written approval of their supervisor, Computer Science Graduate Program Director and the Graduate Program Director of the host faculty for the course.~~

~~Ph. D. students are normally expected to take 50% or more of their course load from Computer Science graduate courses. Any exemption in special cases must be approved by the student's supervisory committee and the Graduate Program Director.~~

~~A list of graduate course options outside of Computer Science is available [here](#).~~

**Program learning outcomes**

## **(C) Detailed proposal information**

### **Enhanced academic opportunities\***

- The CS grad program description currently allows only a pre-approved list of non-CSCI courses. The list is out-of-date, and as other faculties add new graduate courses every year, some of them could be relevant to CS students who are doing research in specific areas. However, any update in this pre-defined list requires approvals of the CS grad curriculum committee as well as the faculty councils of FEAS, FSCI and FBIT, which makes such updates

unnecessarily time-consuming and cumbersome. The proposed changes bring the CS grad program in line with the UOIT graduate policies, and provide more options and flexibility to the students. The general regulations section of UOIT Graduate calendar states: “Graduate students may take graduate courses outside their program with permission from the student’s supervisor (if applicable), graduate program director for the program and the graduate program director for the course.” In order to maintain quality control, this proposal limits the number of out-of-program courses to two courses maximum. This restriction guarantees that CS grad students take at least 50% of their courses from CSCI. Also, as per SGPS regulations, registering in an out-of-program course requires the signatures of the student’ supervisor, CS Graduate program Director and the Graduate Program Director of the faculty where the course is being offered, thus allowing multiple reviews of the request with regard to quality and relevance.

- With regard to CSCI5350G course, after discussion with the instructor, the CS grad curriculum committee has determined that this course had been originally misidentified as a networking course. In reality, the course learning outcomes mostly cover software and platforms used in mobile and pervasive computing. Therefore, the proposal is to move this course to Software Design area.

**Financial/  
resource  
implications\***

No financial or enrolment implication is expected.

**Enrolment  
implications\***

No financial or enrolment implication is expected.

**Transition plan\***

Students who are still in the program can adjust their courses according to the new list, subject to the approval by the Graduate Program Director.

**Additional  
supporting  
information, if  
applicable**

**(D) Impact and consultation**

**Does this change include any indigenous content?\***  Yes  No

**We have consulted with all impacted areas\***  Yes  N/A

**Consultation\***



This proposal has been presented to and approved by the three faculty groups (FEAS, Science, and FBIT) associated with the Computer Science Graduate program.

# CSCI - 5760G - Information and Social Networks: Theory and Application

\*2019-2020 - GR - New Course

## (A) Proposal summary

Home faculty\*

Faculty of Science

This new course is associated with the following:\*

- A Minor Program Adjustment  
 A Major Program Modification  
 A New Program  
 None of the above

Will this new course appear anywhere other than the course description section of the calendar?\*

Yes  No

Program(s) impacted\*

Computer Science Graduate Program (MSc and PhD)

Effective semester\*

Fall 2019

Are you attaching any supporting documents?\*

Yes  No

## (B) Course information

Course subject code\*

CSCI

Course number\* 5760G

Course title (long form)\*

Information and Social Networks: Theory and Application

Course title (short form)\*

Information & Social Networks

Subject area\*

Computer Science

Course description\*

This course studies commonalities across diverse engineered and physical networks such as computer networks, information networks, and social networks. It focuses on rigorous data-driven methods aimed at understanding the structure and dynamics of these networks. We will cover recent research on analysis of large social and information networks and on models and algorithms that abstract their basic properties. Class also reviews fundamental algorithms behind high-impact companies, such as Google, Facebook, etc. We explore how to measure and predict the structure and dynamics of large-scale networks, measure the robustness of networks, make networks more robust, predict the dynamics of information cascades, and develop and test our own data-driven hypotheses about networks. Students are expected to have prior background in linear algebra, probability theory, and Python programming.

**Credit hours\*** 3

**Lecture hours** 3

**Lab hours**

**Tutorial hours**

**Other hours**

**Cross-listing(s)**

**Prerequisite(s)**

**Prerequisite(s) for  
Banner**

**Corequisite(s)**

**Prerequisite(s)  
with concurrency**

**Credit  
restriction(s)**

**Is the credit  
restriction an  
equivalent course?**

**Recommended**

**Course restrictions**

**Course type\***  Core  Elective

**Grade mode\***  N (normal alpha grades)  P (pass/fail grade)

**CLS (in-class  
delivery)\***  Yes  No

**HYB (in-class and  
online delivery)\***  Yes  No

**IND (individual  
studies)\***  Yes  No

**OFF (off-site)\***  Yes  No

**WB1 (virtual meet  
time -**  Yes  No

**WEB (fully online  
- asynchronous)\***  Yes  No

synchronous)\*

N/A (not applicable)\*  Yes  No**Teaching and assessment methods\***

The course final grade comes from 2 assignments, 1 midterm examination, 1 research presentation, and a final project,

**Course learning outcomes\***

On the successful completion of the course, students will be able to:

- Understand and apply methods and algorithms for collecting network data from computer and information networks.
- Analyze large-scale social and information networks and develop and test their own data-driven hypotheses.
- Apply tools and methods for network data visualization.
- Understand the fundamental structural characteristics of networks.
- Understand techniques, algorithms, and tools for measuring the structure and dynamics of networks.
- Demonstrate knowledge of computational models for the dynamics of networks such as information cascade, virus propagation, failure cascade, etc.
- Understand efficient methods for distributed search
- Be able to measure the robustness and resilience of networks against attacks and failure.
- Be able to apply machine learning techniques in the field.

## (C) Impact and consultation

Does this course contain any indigenous content?\*

Yes  No

We have consulted with all impacted areas\*

Yes  N/A

**Consultation\***

The course proposal has been presented to the three faculty groups (FEAS, Science, and FBIT) associated with the Computer Science Graduate program.

## (D) Financial implications

**Financial implications\***

No additional financial implications; is an elective course that will be offered as/when a suitable slot will become available.