

## ACADEMIC COUNCIL REPORT

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### ACTION REQUESTED:

Recommendation   
Decision   
Discussion/Direction   
Information

DATE: 26 February 2018

FROM: Faculty of Business and Information Technology

SUBJECT: Major Program Modification – Master of Information Technology  
Security (MITS) and Master of Information Technology Security:  
Artificial Intelligence in Security (AIS) field

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### COMMITTEE MANDATE:

The Graduate Studies Committee (GSC) reviewed the proposed Major Program Modification in accordance with its mandate under Section III, Part c of the GSC Terms of Reference and recommends approval of the Major Program Modification, as presented.

### MOTION FOR CONSIDERATION:

*That Academic Council approve the modifications to the Master of Information Technology Security programs, as presented.*

### BACKGROUND/CONTEXT & RATIONALE:

The MITS program was the first graduate program at UOIT and prepares students to work in the high-demand IT security industry. Currently, the MITS program includes two options: a project-based option in which students complete eight MITS graduate courses, a MITS seminar and a capstone project; and a course-based option that includes ten MITS graduate courses and a MITS seminar. The program is currently completed over 12 months (three semesters), where students typically take 4-5 courses in each of semesters 1 and 2, and the remaining courses (1-2) plus the capstone project and seminar over the summer.

The option of an internship for this program has been frequently requested by MITS students and strongly recommended by the MITS external advisory committee. An internship option has a number of benefits, including (a) making our program more appealing, (b) helping connect our students to industry, and (c) helping connect industry partners to our university. It also significantly enhances the experiential aspects of the program and prepares students for the job market.

In order to accommodate this change and also to facilitate course selection for part-time students, the Faculty also proposes to change the standard length of the program to 24 months from its current 12 months; students may still elect to complete the program in 12 months. This proposal includes the following modifications to the current Master of IT Security (MITS) program:

- Adding an Internship option
- Increasing the standard length of the program to 24 months

Additionally, the current core course “Special Topics in IT Management” offered in the AIS will be changed to an elective.

#### **RESOURCES REQUIRED:**

No additional resources are required. The internship course will be graded by the MITS graduate program director. Given that the students who take an internship will not take a capstone project (which is also managed by the Graduate program director), the GPD’s workload will not change substantially. The internship will be administered by the existing FBIT Internship and Capstone coordinator.

#### **CONSULTATION AND APPROVAL:**

GSC: January 22nd, 2019

Faculty Council Approval: November 20<sup>th</sup>, 2018

FBIT Graduate Education Committee: November 2, 2018

#### **NEXT STEPS:**

- Pending the approval of Academic Council, these changes will be reflected in the 2019-2020 Graduate Academic Calendar
- The expected date of implementation is the summer semester of 2019.
- Students who began the program in Fall 2018 or later may be given the option to take the internship in Summer 2019, subject to availability of internship positions.

#### **SUPPORTING REFERENCE MATERIALS:**

- Major Program Modification Proposal: MITS
- Major Program Modification Proposal: MITS - AIS
- New Course Proposal: MITS 7000G
- Course Change Proposal: MITS 5620G

# Information Technology Security, MITS

\*2019-2020 - GR - Major Program Modification (Modify Existing Calendar Entry)

## (A) Proposal summary

Home faculty\*

Faculty of Business and Information Technology

Summary of proposed changes\*

### SUMMARY OF PROPOSED CHANGE

This proposal includes the following modifications to the current Master of IT Security (MITS) program:

Adding an Internship option to the MITS program-MITS 7000G as another experiential learning option.

Increasing the standard length of the program to 24 months.

Is a new course associated with this proposal?\*

Yes  No

Effective semester\*

Spring/Summer 2019

Are you attaching any supporting documents?\*

Yes  No

## (B) Program information

Program or shared core name\*

Information Technology Security, MITS

Program type

Master's

Degree type

Master of Information Technology Security

Program or shared core description

Degree requirements for the Master of Information Technology Security (MITS) program are listed below. For general program information, admission requirements, graduate faculty lists and/or details on part-time options, see [Information Technology Security](#).

## Degree requirements

Students are required to complete eight ~~required~~ core courses, a non-credit seminar course, and either a capstone research project I/II, an Internship, or two elective courses for a total of 30 credits. Students must also successfully complete the non-credit MITS 5900G-MITS Seminar course. ~~Approximate~~ The standard time for program completion is 24 months, based on full-time status, ~~is~~. Students may be able to complete program requirements in 12 to 24 months, depending on course availability.

## Course listing

MITS 5100G Law & Ethics of IT Security

MITS 5200G Advanced Communication Networks

MITS 5300G Operating Systems Security

MITS 5400G Secure Software Systems

MITS 5500G Cryptography and Secure Communications

MITS 5600G Security Policies and Risk Management

MITS 6100G Attack and Defence

MITS 6400G Biometrics/Access Control and Smart Card Technology

MITS 5900G MITS Seminar

[Right] \*

[Before]

MITS 6300G IT Security Capstone Research Project I

[Right] \*\*\*

MITS 6600G IT Security Capstone Research Project II

[Right] \*\*\*

MITS 7000G MITS Internship

[Right] \*\*

## Note:

~~\*MITS 5900G-MITS Seminar continues in~~ \*Students have the second semester and concludes in third semester. ~~\*\*Students must either take following options:~~

Take both Capstone Research Project I and II courses, or

**Take two elective courses ~~in their places.~~ They, or  
Take MITS Internship**

**Students** cannot take one capstone course and one elective course. Students may take relevant 5000- or 6000-level courses in Information Technology, Computer Science, Electrical and Computer Engineering or Health Informatics as electives. The choice of elective courses must be approved by the graduate program director for the MITS program prior to course registration.

**\*\* The MITS internship course (MITS 7000G) must be at least 12 weeks full time or 420 hours in length and replaces MITS 6300G/MITS6600G, subject to internship position availability. Internships are arranged through the FBIT Internship and Capstone coordinator and must be approved by the Graduate Program Director.**

**Program learning  
outcomes**

**Program learning outcomes**

The program learning outcomes do not change; however, the internship option will provide practical knowledge in the area of IT security through working in the professional sector, and as such, enhances the following areas consistent with the provincial degree level expectations:

- Depth and breadth of knowledge
- Application of knowledge
- Communication skills
- Awareness of limits of knowledge
- Autonomy and professional capacity

**(C) Detailed proposal information**

**Brief background  
on existing  
program\***

This proposal includes the following modifications to the current Master of IT Security (MITS) program:

- Adding an Internship option to the MITS program
- Increasing the standard length of the program to 24 months

**Rationale for the  
modification\***

The MITS program was the first graduate program at UOIT. It is a graduate degree program that prepares students to work in the high-demand IT security industry. The program content was built around the core skill set in the Certified Information Systems Security Professional (CISSP) exam, a highly reputed IT security certification granted by (ISC)<sup>2</sup>. Through theory and applied learning, the

program enables students to develop an extensive understanding of business and information technology security, polish communication skills and examine business and IT ethics in a team environment.

Currently, the MITS program includes two options: a project-based option in which students complete eight MITS graduate courses, a MITS seminar and a capstone project; and a course-based option that includes ten MITS graduate courses and a MITS seminar. The program is currently completed over 12 months (three semesters), where students typically take 4-5 courses in each of semesters 1 and 2, and the remaining courses (1-2) plus the capstone project and seminar over the summer. A majority of MITS courses are offered in the evenings to accommodate students who work full time in the business and industry.

The option of an internship for this program is an idea that has been requested most frequently by MITS students and has also been strongly recommended by the MITS external advisory committee. An internship option has a number of benefits, including (a) making our program more appealing than competing programs in the GTA, (b) helping connect our students to industry, and (c) helping connect industry partners to our university. It also significantly enhances the experiential aspects of the program and prepare students for the job market.

With this change, MITS students will now have 3 options for their degree:

- (1) Course option (students must take 2 electives)
- (2) Capstone option (students must enroll in Capstone I and Capstone II, and find a faculty supervisor for their project).
- (3) Internship option (proposed new option).

In order to accommodate this change and also to facilitate course selection for part-time students, it is also proposed to change the standard length of the program to 24 months from its current 12 months. This change provides several advantages for students in the MITS program:

- (1) It allows a flexible Internship time up to 12 months.
- (2) It streamlines the length of MITS program with other Master's programs at UOIT, e.g. the Master of Engineering and other Master of Science programs.
- (3) It facilitates course selection for part-time students in the program. Currently, the part-time option is not available to students in some MITS fields due to scheduling restrictions. With this change, students will have greater flexibility to select their internship semester in the program.
- (4) The students have regularly commented on the heavy workload of the program, which currently requires 4 to 5 graduate courses a semester. Streamlining the length of the program to 2 years would help students to focus on a regular load of 2-3 graduate courses in a semester, improve their learning performance and succeed better in the program.

(5) This change will allow international graduates of the program to receive a longer postgraduate work permit in Canada, thus improving their experience and knowledge and making the program more attractive to international students.

A fast-track option will remain available to students who prefer completing the program in 12 months.

**Fit with broader array of program offerings\***

See above.

**Faculty members\***

**Faculty members**

The internship course MITS7000G will be graded by the MITS graduate program director. Given that the students who take an internship will not take a capstone project (which is also managed by the Graduate program director), the GPD's workload will not change substantially.

**Additional academic and non-academic human resources\***

The internship will be administered by the existing FBIT internship infrastructure which is managed by the FBIT Internship and Capstone coordinator.

**Physical resource requirements\***

N/A

**Statement of funding requirements\***

No additional funding is required for this program change.

**Statement of resource availability\***

All the required resources for implementation of the proposed change is available at the faculty.

**Transition plan\***

Summer 2019

Students who start in Fall 2018 and later may be given the option to take the internship in Summer 2019, subject to major modification approval timeline and availability of internship positions.

**Additional supporting information, if applicable**

**Admission Requirements**

MITs program admission requirements will not change. The letter of admission will specify the Internship option.

## Program Structure

The program structure for the MITS and MTS-AIS programs will not change. Students will have the option of taking the MITS 7000G (six credits) in place of MITS 6300G and MITS 6600G (three credits each). UOIT SGPS rules regarding the credit limit for part-time studies will continue to apply.

## (D) Impact and consultation

Does this change include any indigenous content?\*

Yes  No

We have consulted with all impacted areas\*

Yes  N/A

Consultation\* N/A

# Information Technology Security, MITS - Artificial Intelligence in Security field

\*2019-2020 - GR - Major Program Modification (Modify Existing Calendar Entry)

## (A) Proposal summary

Home faculty\*

Faculty of Business and Information Technology

Summary of proposed changes\*

This proposal includes the following modifications to the current Master of IT Security program Artificial Intelligence in Security field:

Adding an Internship option to the MITS program  
Increasing the standard length of the program to 24 months  
Change the course Special Topics in IT Management to Elective

Is a new course associated with this proposal?\*

Yes  No

Effective semester\*

Spring/Summer 2019

Are you attaching any supporting documents?\*

Yes  No

## (B) Program information

Program or shared core name\*

Information Technology Security, MITS - Artificial Intelligence in Security field

Program type

Master's

Degree type

Master of Information Technology Security

Program or shared core description

Degree requirements for the Master of Information Technology Security (MITS) program are listed below. For general program information, admission requirements, graduate faculty lists and/or details on part-time options, see [Information Technology Security](#).

## Degree requirements

The program includes ~~eight~~ **seven** courses, a seminar and a capstone project **or internship** as follows:

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

**MITS 5400G Secure Software Systems**

**MITS 5500G Cryptography and Secure Communications**

**MITS 5600G Security Policies and Risk Management**

~~**MITS 5620G Special Topics in IT Management**~~

**MITS 6700G Complex Networks**

**MITS 6800G Machine Learning**

**MITS 5900G MITS Seminar**

[Right] \*\*

**MITS 6300G IT Security Capstone Research Project**

**I**

[Right] \*\*

**MITS 6600G IT Security Capstone Research Project**

**II**

[Right] \*\*

**MITS 7000G MITS Internship**

[Right] \*\*

[After] **One Two** elective ~~course courses~~ by graduate program director approval\*

## Note:

\*The elective course could include relevant courses from MITS, CSCI or ENGR graduate course listing.

~~\*\*The rules for~~ \*\* The students must either take the ~~seminar and two~~ capstone project ~~remain~~ courses (MITS 6300G/6600G), or the ~~same as the~~ MITS internship course (MITS 7000G). The MITS ~~general stream~~ internship work must be at least 12 weeks full time or 420 hours in length and replaces MITS 6300G/MITS6600G, subject to internship position availability. Internships are arranged through FBIT Internship and Capstone coordinator and must be approved by the Graduate Program Director.

Program learning outcomes

**Brief background  
on existing  
program\***

The MITS program was the first graduate program at UOIT. It is a graduate degree program that prepares students to work in the high-demand IT security industry. The program content was built around the core skill set in the Certified Information Systems Security Professional (CISSP) exam, a highly reputed IT security certification granted by (ISC)<sup>2</sup>. Through theory and applied learning, the program enables students to develop an extensive understanding of business and information technology security, polish communication skills and examine business and IT ethics in a team environment.

The purpose of the MITS-AIS field is to prepare and train IT professionals for the emerging applications of Artificial Intelligence in the field of IT Security. This professional stream is the first of its kind in Canada and builds upon the successful general stream in UOIT Master of IT security program. This program combines a deep knowledge of IT Security with hands-on knowledge of AI systems and machine learning and provides students with a comprehensive understanding of the applications of this technology. Graduates of this program can seek employment in the growing AI industry as well as IT security firms.

The option of an internship for this program is an idea that has been requested most frequently by MITS students and has also been strongly recommended by the MITS external advisory committee. An internship option has a number of benefits, including (a) making our program more appealing than competing programs in the GTA, (b) helping connect our students to industry, and (c) helping connect industry partners to our university. It also significantly enhances the experiential aspects of the program and prepare students for the job market.

With this change, MITS students will now have two options for their MITS-AIS degree:

- (1) Capstone option (students must enroll in Capstone I and Capstone II, and find a faculty supervisor for their project).
- (2) Internship option (proposed new option).

In order to accommodate this change and also to facilitate course selection for part-time students, it is also proposed to change the standard length of the program to 24 months from its current 12 months. This change provides several advantages for students in the MITS-AIS program:

- (1) It allows a flexible Internship time up to 12 months.
- (2) It streamlines the length of MITS-AIS program with other Master's programs at UOIT, e. g. the Master of Engineering and other Master of Science programs.
- (3) It facilitates course selection for part-time students in the program. Currently, the MITS-AIS field does not include a part-time option due to course scheduling restrictions. With this change, students will have greater flexibility to select their internship semester in the program.
- (4) The students have regularly commented on the heavy workload of the program, which currently requires 4 to 5 graduate courses a semester. Streamlining the length of the program to 2 years would help students to

focus on a regular load of 2-3 graduate courses in a semester, improve their learning performance and succeed better in the program.

(5) This change will allow an international graduate of the program to receive a longer postgraduate work permit in Canada, thus improving their experience and knowledge and making the program more attractive to international students.

A fast-track option will remain available to students who prefer to complete the program in 12 months.

The proposal also intends to change the mandatory course MITS 5620G (Special topics in IT management) to elective, and as such, change the number of elective courses in the program to 2 (from the current 1). MITS 5620G was offered once this year with a content that was focused on Block Chain technologies. This topic is now being developed as a standalone course on its own, and the area believes that it should be elective. The change would provide more flexibility for the students to take courses in various specialized applied AI areas depending on their interests.

**Rationale for the modification\*** \*see above

**Fit with broader array of program offerings\*** \*see above

**Faculty members\*** The internship course MITS7000G will be graded by the MITS graduate program director. Given that the students who take internship will not take a capstone project (which is also managed by the Graduate program director), the GPD's workload will not change substantially.

**Additional academic and non-academic human resources\*** The internship will be administered by the existing FBIT internship infrastructure which is managed by the FBIT Internship and Capstone coordinator.

**Physical resource requirements\*** N/A

**Statement of funding requirements\*** No additional funding is required for this program change.

**Statement of resource availability\*** All the required resources for implementation of the proposed change is available at the faculty.

**Transition plan\***  
Summer 2019  
Students who start in Fall 2018 and later may be given the option to take the internship in Summer 2019, subject to major

modification approval timeline and availability of internship positions.

**Additional supporting information, if applicable** N/A

## (D) Impact and consultation

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

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

**Consultation\*** N/A

# MITIS - 7000G - MITIS Internship

\*2019-2020 - GR - New Course

## (A) Proposal summary

Home faculty\*

Faculty of Business and Information Technology

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\*

Master of IT Security

Master of IT Security – Artificial Intelligence in Security field

Effective semester\*

Spring/Summer 2019

Are you attaching any supporting documents?\*

- Yes  No

## (B) Course information

Course subject code\*

MITIS

Course number\* 7000G

Course title (long form)\* MITIS Internship

Course title (short form)\* MITIS Internship

Subject area\*

Information Technology Security

**Course description\***

The MITS Internship course is an important experiential learning component of the MITS program, and its objective is to provide students with practical exposure to actual work environments in IT security businesses and industries, which is essential for a more complete understanding of the application of IT Security theories and procedures. The Internship program permits MITS students to be registered who have met the minimum requirements of the program. The result of the program and course are to further develop a student's skill set and experience in their field of study, and provide them with an opportunity to gain actual work experience in organizations they may consider for future careers post-graduation.

**Credit hours\*** 6**Lecture hours****Lab hours****Tutorial hours****Other hours** 6**Cross-listing(s)****Prerequisite(s)** Must have completed at least four courses from the MITS/MITS-AIS program**Prerequisite(s) for Banner****Corequisite(s)****Prerequisite(s) with concurrency****Credit restriction(s)****Is the credit restriction an equivalent course?****Recommended****Course restrictions** MITS 6300G and MITS 6600G**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 - synchronous)\***  Yes  No

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

**N/A (not applicable)\***  Yes  No

**Teaching and assessment methods\***

Student interns are required to present a comprehensive report on their internship experience to the internship program director within six weeks of completing their internship employment. The internship report must be of high-quality and professionally presented in hard copy format, organization, style, spelling, grammar, and appearance (as well as in content). A professional report should include a cover page, table of contents, an executive summary (that will state the problem or problems that the student worked on, describe his/her activities and summarize his/her findings), and any relevant appendices. A formal citation style (APA or MLA) is also required for all sources of information presented. Reports that do not demonstrate adequate professionalism will be returned for revision.

The interns' direct work supervisor/manager will provide an assessment of the intern's performance on the job, which will be incorporated into the overall evaluation by the faculty FBIT internship coordinator. It is the student's responsibility to ensure the work supervisor submitted their completed evaluation to the Coordinator by the time they submit the Final Report.

**Course learning outcomes\***

The Internship course will provide students with an opportunity to;

- Gain practical experience within the IT security industry,
- Acquire knowledge of the industry in which the internship contract is completed,
- Apply their academic knowledge learned in the classroom in a work setting,
- Develop a greater understanding about career options while more clearly defining personal career goals, interests, and industry connections.

## (C) Impact and consultation

**Does this course contain any indigenous content?\***  Yes  No

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

**Consultation\*** N/A

## (D) Financial implications

Financial  
implications\* N/A

# MIT5 - 5620G - Special Topics in IT Management

\*2019-2020 - GR - Course Change v2

## (A) Proposal summary

Home faculty\*

Faculty of Business and Information Technology

Course changes\*

- Contact hours
- Co-requisite(s)
- Course description
- Course instructional method
- Course number or course subject code
- Course title
- Credit restriction(s) and/or equivalencies
- Credit weighting
- Cross-listing(s)
- Grade mode
- Learning outcomes
- Prerequisite(s)
- Remove course from academic calendar
- Teaching and assessment methods
- Other

Other changes

Change course type from core to elective.

Is this course change associated with a program proposal?\*

Yes  No

Reason for change and ways in which it maintains/enhances course/program objectives\*

To change the MIT5 5620G from core to elective.

Financial implications\*

N/A

Effective semester\*

Fall 2019

Are you attaching any supporting documents?  Yes  No

Additional supporting information, if applicable

## (B) Course information

Course subject code\*

Course number\* 5620G

Course title (long form)\* Special Topics in IT Management

Course title (short form)

Subject area

Course description This course focuses on topics in IT Management that are not currently covered by the other courses in the program. Topics may vary depending on the interest of the students and the availability of faculty. A detailed description of the course content will be posted before the start of term.

Credit hours 3

Lecture hours

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**

**Activity Log**

Lee Bazely

+ Elective

- Core

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 - synchronous)**  Yes  No

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

**N/A (not applicable)**  Yes  No

**Teaching and assessment methods**

**Course learning outcomes**

**(C) Impact and consultation**

**Does this course contain any indigenous content?\***  Yes  No

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

**Consultation\*** N/A