

Minor Program Adjustment Template

Faculty: Business and IT	Date: June 16, 2017
Program: Bachelor of Information Technology – Networking and IT Security Specialization	
Undergraduate: <input checked="" type="checkbox"/>	Graduate: <input type="checkbox"/>

Minor Program Adjustments include: New required courses, Deletion of required courses, Other changes to degree requirements or program learning outcomes, New academic requirements or changes to existing requirements.

Motion: That CPRC approve the changes to the Networking and Security program as presented.

Proposal Brief

Summary of the proposed change

1. Add INFR1400U Statistics and Probability for I.T.as a core course
2. Remove INFR3710 Signals and Random Processes
3. Add core course: INFR3700U Machine Learning.
4. Remove INFR4621 as a core course and replace this with a technical elective

Description of the ways in which the proposed change will enhance the academic opportunities

INFR-1400U is a new course that covers statistic and probability, and this material is required for the addition of the Year 3 core course, INFR3700U Machine Learning.

Upon re-evaluation of the course content in INFR3710, the area decided that the content is no longer relevant to all graduate in Networking and Security. A portion of the material is now be covered in INFR3720.

It was also the decision of the area that a course on machine learning is more beneficial for the students in the major. Machine Learning is a hot topic both in the industry and in research, and it will continue being an expected component in the education of IT professionals for the years to come. UOIT students are currently graduating without this important course which has become mandatory in many universities. Including it as part of the core curriculum will give our students the edge and competitive advantage to succeed in their careers.

A technical elective will replace INFR4621 Data Centre and Design as a core course. Not all graduates from the program need to know about Data center design. By having a technical elective course, students would have more choice to learn about different subjects as they see align with their career objective. Additionally, replacing the course with a technical elective allows the program to be more agile and more reactive to changes in learning expectations and industry demand. INFR4621 will still be available to students as a technical elective.

The objective is move all courses in fourth year as technical elective, so we can be agile and more reactive to changes in learning outcomes and industry demand. Also, students will have more choices, and more diverse as they chose different courses.

Process of consultation with other units if the change(s) involves students, staff and faculty from other programs of courses

No impact on other units.

Transition Plan

Students completing degree requirements in Winter 2018 must take INFR 4621U, anyone after can choose INFR 4621U as technical elective.

Analysis of the financial and enrolment implications

None

Proposed Implementation Date

Fall 2018

Calendar Copy and Program Maps (highlight revisions to existing curriculum)

Year 1

Semester 1 (15 credit hours)

- BUSI 1600U – Management of the Enterprise
- BUSI 1020U – Business Communications
- INFR 1010U – Discrete Mathematics
- INFR 1100U – Introduction to Programming
- INFR 1411U – Introduction to Networking I
- INFR 2495U – IT Skills Workshop 1

Semester 2 (15 credit hours)

- BUSI 2000U – Collaborative Leadership
- INFR 1421U – Introduction to Networking II
- INFR 1016U – Introductory Calculus
- INFR 2140U – Object Oriented Programming
- INFR 2810U – Computer Architecture
- INFR 2496U – IT Skills Workshop II

Year 2

Semester 1 (15 credit hours)

- BUSI 2120U – Accounting for IT
- BUSI 2550U – Introduction to Project Management
- Add : INFR1400U – Statistics & Probability for I.T.
- INFR 2411U – Advanced Networking I
- INFR 2600U – Introduction to Computer Security
- INFR 3120U – Web and Script Programming
- INFR 3495U – IT Skills Workshop III

Semester 2 (15 credit hours)

- General elective
- INFR 1550U – Law and Ethics of IT
- INFR 2421U – Advanced Networking II
- INFR 2820U – Algorithms and Data Structures
- INFR 2830U – Operating Systems

- INFR 3496U – IT Skills Workshop IV
- Year 3**
- Semester 1 (15 credit hours)**
- **General elective**
- INFR 2431U – Advanced Networking III
- INFR 2670U – Introduction to Cloud Services
- INFR 3600U – Cryptography and Network Security
- ~~INFR 3710U – Signals and Random Processes~~
- **Add: INFR 3700U – Machine Learning**
- **Add: BUSI 2550U – Intro to Project Management**
- Semester 2 (15 credit hours)**
- ~~Open elective~~
- General Elective
- INFR 3610U – Operating System Security
- INFR 3720U – Basics of Digital Transmission
- INFR 3810U – Database Systems
- INFR 3850U – Enterprise Network Management
- Year 4**
- Semester 1 (15 credit hours)**
- Two open electives
- INFR 4661U – Security Analysis
- INFR 4680U – IT Security Policies and Procedures
- One of:
- BUSI 4798U – Incubator I **or**
- BUSI 4990U – Capstone Study Project I
- Semester 2 (15 credit hours)**
- Open elective
- Technical elective
- ~~INFR 4621U – Data Centre Design~~
- **ADD: Technical elective**
- INFR 4690U – IT Forensics
- One of:
- BUSI 4799U – Incubator II **or**
- BUSI 4995U – Capstone Study Project II

Date of submission	June 16, 2017
Curriculum Committee approval	October 23, 2017
Faculty Council approval	November 2, 2017

TEMPLATE 8-B**COURSE CHANGE TEMPLATE***For new courses see New Course Template*

Faculty: Business and Information Technology	
Program: Bachelor of Information Technology – Networking and IT Security	
Subject Code and Course Number: INFR3710U	Current Full Course Title: Signals and Random Processes
<input checked="" type="checkbox"/> Core <input type="checkbox"/> Elective	Current Short-Form Course Title (max. 30 characters):

COURSE CHANGES (check all that apply)

<input type="checkbox"/>	Course title	<input type="checkbox"/>	Credit weighting
<input type="checkbox"/>	Course description	<input type="checkbox"/>	Contact hours
<input type="checkbox"/>	Course number	<input type="checkbox"/>	Prerequisites
<input type="checkbox"/>	Subject code	<input type="checkbox"/>	Co-requisites
<input type="checkbox"/>	Grade Mode (N – alpha grade, P – Pass/Fail)	<input type="checkbox"/>	Cross-listings
<input type="checkbox"/>	Learning outcomes	<input type="checkbox"/>	Credit restrictions
<input type="checkbox"/>	Course Instructional Method (CLS, HYB, WB1, WEB)	<input checked="" type="checkbox"/>	Delete course from Program only (attach this form to program modification)
<input checked="" type="checkbox"/>	Delete course from Academic Calendar	<input type="checkbox"/>	Teaching and assessment methods
<input type="checkbox"/>	Supplementary Fees	<input type="checkbox"/>	Term Change
<input type="checkbox"/>	Other (please specify)		

DESCRIPTION AND/OR REASON FOR CHANGE AND WAYS IN WHICH IT MAINTAINS/ENHANCES COURSE/PROGRAM OBJECTIVES

Outdated content that is no longer relevant to the students. A portion of the material will now be covered in INFR3720 Digital Transmissions.
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CHANGE TO CALENDAR ENTRY (if required)

Current	Proposed

CONSULTATION AND FINANCIAL IMPLICATIONS, WHERE APPROPRIATE

None

EFFECTIVE SEMESTER (Specify Term e.g. Fall 2018)

Fall 2018

APPROVAL DATES

Faculty Curriculum Committee approval	October 23, 2017
Faculty Council approval	November 2, 2017

Reported to CPRC	November 2017
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TEMPLATE 8-A**NEW COURSE TEMPLATE**

For changes to existing courses see Course Change Template

Faculty: Business and Information Technology			
Full Course Title: Statistics and Probability for I.T.			
Short Form Course Title (max 30 characters): Stat for IT			
Subject Code and Course number: INFR1400U	Cross-listings: None	<input checked="" type="checkbox"/> Core <input type="checkbox"/> elective	Credit weight: 3.0
Contact hours (please indicate number of hours for each component):			
<input checked="" type="checkbox"/> Lecture 3hr <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial 1.5 hr <input type="checkbox"/> Other			

PROGRAM(S) (if applicable, form should accompany a program adjustment/proposal)

Bachelor of Information Technology – Networking and IT Security This course does not impact any other program
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CALENDAR DESCRIPTION

This course introduces the concepts and techniques of statistics and probability theory as applied to information technology and science. Topics include: frequency distributions; graphic presentation of data, basic concepts of probability theory, marginal probability, conditional probability, independence, discrete and continuous random variables; probability distributions; mean and variance; the central limit theorem; statistical inference and estimation, confidence intervals; correlation and regression analysis, examples of application in the field of IT and IS. This course may be offered in a hybrid format with 1.5 hours of lectures and 1.5 hours of online lectures and self-learning material

Prerequisites	INFR1010U and INFR1016U
Co-requisites	
Credit restrictions	INFR3710U, BUSI1450U
Credit exemptions	
Grading scheme	<input checked="" type="checkbox"/> letter grade <input type="checkbox"/> pass/fail

LEARNING OUTCOMES (this section is required)

<ul style="list-style-type: none"> • Collect, organize and present data in appropriate graphs, charts, and tables. • Calculate numerical measures to summarize and analyse data. • Use computer tools to generate statistical displays and analyses. • Define probability concepts such as outcome, event, and probability of an event; and solve problems based on probability. • Calculate marginal and conditional probabilities • Define random variables and probability distributions; and find the mean, variance, and standard deviation of the probability distribution of a discrete random variable. • Describe the concept of the sampling distribution, and apply the central limit theorem. • Develop confidence interval estimates for the mean and proportion. • Determine appropriate sample sizes. • Perform correlation analysis and linear regression. • Employ multiple regression analysis in a process of model building.

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COURSE INSTRUCTIONAL METHOD

(check all that <u>may</u> apply)	<input checked="" type="checkbox"/> CLS (in-class)	<input checked="" type="checkbox"/> HYB (in-class and online)
	<input type="checkbox"/> WB1 (synchronous online delivery)	
	<input type="checkbox"/> WEB (asynchronous online delivery)	

TEACHING AND ASSESSMENT METHODS

Assignments 30%
Midterm 20%
Final Exam 50%

CONSULTATION AND FINANCIAL IMPLICATIONS, WHERE APPROPRIATE

N/A

EFFECTIVE SEMESTER (Specify Term e.g. Fall 2017)

Fall 2018

APPROVAL DATES

Curriculum Committee approval	<i>October 23, 2017</i>
Faculty Council approval	November 2, 2017
Submission to CPRC/GSC	November 2017

TEMPLATE 8-A

NEW COURSE TEMPLATE

For changes to existing courses see Course Change Template

Faculty: Faculty of Business and IT			
Full Course Title: Machine Learning			
Short Form Course Title (max 30 characters):			
Subject Code and Course number: INFR3700U	Cross-listings: MITS 6800G	<input checked="" type="checkbox"/> Core Elective <input type="checkbox"/>	Credit weight: 3CR
Contact hours (please indicate number of hours for each component):			
<input checked="" type="checkbox"/> Lecture __1.5__ <input type="checkbox"/> Lab _____ <input type="checkbox"/> Tutorial _____ <input checked="" type="checkbox"/> Other 1.5_____			

PROGRAM(S) IMPACTED [For a core course, please list all impacted programs including any applicable fields or specializations here and include this form with a program adjustment/proposal; for an elective course being inserted anywhere other than the Course Description section of the Academic Calendar, please list all impacted programs including any applicable fields or specializations and place the Calendar copy for each here (e.g. in a list of electives tied to a specific program).]

Bachelor of Information Security

CALENDAR DESCRIPTION

In this course students learn to program a computer system to make predictions on, classify, or cluster data that the system has never seen before. Topics include theory and practice of supervised and unsupervised learning, covering well-known algorithms such as ordinary and penalized linear regression, Naïve Bayes, support vector machines, ensemble methods, K-means, dimensionality reduction, neural networks, deep neural networks, and TensorFlow. The course uses the Python programming language.

Prerequisites	INFR1100U, INFR2140U, INFR1400U
Co-requisites	
Credit restrictions	
Equivalency courses	
Grading scheme	<input checked="" type="checkbox"/> letter grade <input type="checkbox"/> pass/fail

LEARNING OUTCOMES (this section is required)

1. Analyze data to understand its characteristics.
2. Choose the learning algorithm that is most appropriate for a given data set.
3. Create a machine learning model based on the data characteristics.
4. Use machine learning libraries to perform data analysis.
5. Generate graphs that help understand data and the performance of machine learning algorithms.
6. Demonstrate theoretical foundations of machine learning that are adequate of IT professionals.

COURSE INSTRUCTIONAL METHOD

(check all that may apply) <input type="checkbox"/> CLS (in-class) <input checked="" type="checkbox"/> HYB (in-class and online)

- IND (individual studies)** **OFF (off-site)**
 WB1 (synchronous online delivery)
 WEB (asynchronous online delivery)

TEACHING AND ASSESSMENT METHODS

Participation: 10%
 Assignment(s): 20%
 Midterm: 30%
 Final Project: 40%

CONSULTATION AND FINANCIAL IMPLICATIONS, WHERE APPROPRIATE

There are no consultation or financial implications. Dr Miguel Vargas Martin is currently teaching this course as a General Elective.

EFFECTIVE SEMESTER (Specify Term e.g. Fall 2017)

Fall 2018

APPROVAL DATES

Curriculum Committee approval	October 23, 2017
Faculty Council approval	November 2, 2017
Submission to CPRC/GSC	November 2017

TEMPLATE 8-B

COURSE CHANGE TEMPLATE

For new courses see New Course Template

Faculty: Business and Information Technology	
Program: Networking and IT Security	
Subject Code and Course Number: INFR 4621U	Current Full Course Title: Data Centre Design
<input checked="" type="checkbox"/> Core <input type="checkbox"/> Elective	Current Short-Form Course Title (max. 30 characters):

COURSE CHANGES (check all that apply)

<input type="checkbox"/>	Course title	<input type="checkbox"/>	Credit weighting
<input type="checkbox"/>	Course description	<input type="checkbox"/>	Contact hours
<input type="checkbox"/>	Course number	<input type="checkbox"/>	Prerequisites
<input type="checkbox"/>	Subject code	<input type="checkbox"/>	Co-requisites
<input type="checkbox"/>	Grade Mode (N – alpha grade, P – Pass/Fail)	<input type="checkbox"/>	Cross-listings
<input type="checkbox"/>	Learning outcomes	<input type="checkbox"/>	Credit restrictions
<input type="checkbox"/>	Course Instructional Method (CLS, HYB, WB1, WEB)	<input type="checkbox"/>	Equivalency Courses
<input type="checkbox"/>	Delete course from Academic Calendar	<input checked="" type="checkbox"/>	Delete course from Program only (attach this form to program modification)
<input type="checkbox"/>	Supplementary Fees	<input type="checkbox"/>	Teaching and assessment methods
<input checked="" type="checkbox"/>	Other (please specify) Change to Elective (not core)	<input type="checkbox"/>	Term Change

DESCRIPTION AND/OR REASON FOR CHANGE AND WAYS IN WHICH IT MAINTAINS/ENHANCES COURSE/PROGRAM OBJECTIVES

<p>Not all graduates from the program need to know about Data center design. By having a technical elective course, students would have more choice to learn about different subjects as they see align with their career objective. Additionally, replacing the course with a technical elective allows the program to be more agile and more reactive to changes in learning expectations and industry demand. INFR4621 will still be available to students as a technical elective.</p>
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CHANGE TO CALENDAR DESCRIPTION (if required)

Current	Proposed

CHANGE TO CONTACT HOURS (if applicable, indicate changes to total contact hours; changes to frequency (e.g. 1x3 hours to 2X1.5 hours) not required):

Lecture	Lab
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Tutorial	Other
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OTHER CHANGES (if applicable)

Prerequisites	
Co-requisites	
Credit restrictions	
Grading scheme	<input type="checkbox"/> letter grade <input type="checkbox"/> pass/fail

CHANGES TO LEARNING OUTCOMES (if applicable)

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CONSULTATION AND FINANCIAL IMPLICATIONS, WHERE APPROPRIATE

N/A

EFFECTIVE SEMESTER (Specify First Active Term e.g. Fall 2017)

Fall 2018

APPROVAL DATES

Faculty Curriculum Committee approval	October 23, 2017
Faculty Council approval	November 2, 2017
Reported to CPRC	November 2017