DECISION ACADEMIC

Lakehead University
Faculty of Engineering

REQUEST REPORT

Request Tracking Number: 2013-ENG-2935
Request Title: Software Engineering

Request Effective Date: Fall 2014
Request Status: In Workflow
Request can't be split

Request Contents

Type		Title
1.	New Version of a Course	Numerical Methods and Modeling
2.	New Version of a Course	Principles of Operating Systems
3.	New Version of a Course	Database Systems
4.	New Version of a Course	Digital Communications
5.	New Version of a Course	Software Engineering Design I
6.	New Version of a Course	Software Engineering Design II
7.	New Version of a Course	Software Engineering
8.	New Version of a Course	Software Design and Testing
9.	New Version of a Course	Performance Analysis of Software
10.	New Version of a Course	Data Management and Information Systems
11.	New Version of a Course	Signal Processing for Software Engineers

Request History

Workflow Step	Workflow Action	User	Change Made	Comments	Date
Initiator	Approved	Laura Parker	Yes	Submitted to workflow	11/27/2013
Dean and Faculty Council Review Stage	Approved	David Barnett	No	approved	11/27/2013

Supporting Documents

File Name	Uploaded By	Upload Date	Size

Printed: 11/27/2013

Supporting Documents Audit Trail

File Name	User	Date	Action

Notes

Date	User	Note

1.	New Version of a Course	Engineering 3558 - Numerical Methods and Modeling

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 3558 - Numerical Methods and Modeling **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 3558 - Numerical Methods and Modeling **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 3558	**Code** Engineering 3558
Title Numerical Methods and Modeling	**Title** Numerical Methods and Modeling
Description Numerical solution of ordinary differential and algebraic equations. Software development for computer aided simulation of complex processes involving principles of mechanical, structural, chemical and electrical engineering.	**Description** Numerical ~~solution of ordinary differential and algebraic equations. Software development for computer aided simulation of complex processes involving principles of mechanical, structural, chemical and electrical engineering~~*method algorithms for modeling and solving engineering problems with a predictable error rate. Topics include numerical calculus, optimization, initial value problems, boundary value problems, and the software development of these algorithms*.
End Term No Specified End Date	**End Term** No Specified End Date
Institution Lakehead University	**Institution** Lakehead University
Faculty Faculty of Engineering	**Faculty** Faculty of Engineering
CreditWeight 0.5	**CreditWeight** 0.5
Rationale	**Rationale** *To reflect Engineering content in course description per accreditation requirements.*
Requiredor Elective	**Requiredor Elective** Required
Cross List	**Cross List**
Offering 0-0; 3-1.5	**Offering** 0-0; 3-1.5
Prerequisites	**Prerequisites**

Corequisites	**Corequisites**
Notes	**Notes**
SpecialTopicDropdown	**SpecialTopicDropdown**
GradeSchemePF	**GradeSchemePF**
EffectonEnrolmentINIT	**EffectonEnrolmentINIT** *No*
EffectonEnrolmentOTHER	**EffectonEnrolmentOTHER** *No*
AdditionalTeachingSpace	**AdditionalTeachingSpace** *No*
EffectonTeachingLoads	**EffectonTeachingLoads** *No*
EffectonServices	**EffectonServices** *No*
DirectinkindSupport	**DirectinkindSupport** *No*

2.	New Version of a Course	Engineering 3655 - Principles of Operating Systems

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 3655 - Principles of Operating Systems **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 3655 - Principles of Operating Systems **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 3655	**Code** Engineering 3655
Title Principles of Operating Systems	**Title** Principles of Operating Systems
Description Process management; co-ordination, synchronization, threads, concurrency with coding examples; memory and cache management with coding examples; CPU scheduling; file management; I/O device drivers. Introduction to the principles of distributed operating systems including networking protocols, socket programming, distributed file systems, remote IPC mechanisms with coding examples. Introduction to real-time operating systems.	**Description** ~~Process management; co-ordination, synchronization, threads, concurrency with coding examples; memory and cache management with coding examples; CPU scheduling; file management; I/O device drivers. Introduction to the principles of distributed operating systems including networking protocols, socket programming, distributed file systems, remote IPC mechanisms with coding examples. Introduction to real-time operating systems~~*This course covers the main components of modern operating systems: computer and OS architecture, processes and process management, threading, CPU scheduling, memory management, file management, I/O device management, with implementation examples taken from real-world operating systems (including real-time OS and distributed OS) and coding exercises*.
End Term No Specified End Date	**End Term** No Specified End Date
Institution Lakehead University	**Institution** Lakehead University
Faculty Faculty of Engineering	**Faculty** Faculty of Engineering
CreditWeight 0.5	**CreditWeight** 0.5
Rationale	**Rationale** *To reflect Engineering content in course description per accreditation requirements.*
Requiredor Elective	**Requiredor Elective**
Cross List	**Cross List**

Offering 3-1.5; 0-0	**Offering** 3-1.5; 0-0
Prerequisites	**Prerequisites**
Corequisites	**Corequisites**
Notes	**Notes**
SpecialTopicDropdown	**SpecialTopicDropdown**
GradeSchemePF	**GradeSchemePF**
EffectonEnrolmentINIT	**EffectonEnrolmentINIT** *No*
EffectonEnrolmentOTHER	**EffectonEnrolmentOTHER** *No*
AdditionalTeachingSpace	**AdditionalTeachingSpace** *NO*
EffectonTeachingLoads	**EffectonTeachingLoads** *No*
EffectonServices	**EffectonServices** *No*
DirectinkindSupport	**DirectinkindSupport** *No*

3.	New Version of a Course	Engineering 3675 - Database Systems

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 3675 - Database Systems **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 3675 - Database Systems **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 3675	**Code** Engineering 3675
Title Database Systems	**Title** Database Systems
Description Database management systems. Introduction to database design. Entity-Relationship modeling. Logical database design. Schema refinement and normal forms. Relational algebra and calculus. SQL queries. Database security. Database application development. Database connectivity to engineering software such as Autocad.	**Description** ~~Database management systems.~~ Introduction to database ~~design. Entity-Relationship modeling.~~ *management systems;* Logical database design~~.~~*;* Schema refinement and normal forms~~. Relational algebra and calculus. SQL queries. Database security.~~*; Storage and indexing; Database security; Data Warehousing and data mining;* Database application development~~. Database connectivity to engineering software such as Autocad.~~
End Term No Specified End Date	**End Term** No Specified End Date
Institution Lakehead University	**Institution** Lakehead University
Faculty Faculty of Engineering	**Faculty** Faculty of Engineering
CreditWeight 0.5	**CreditWeight** 0.5
Rationale	**Rationale** *To update current course content.*
Requiredor Elective	**Requiredor Elective** Required
Cross List	**Cross List**
Offering 0-0; 3-1.5	**Offering** 0-0; 3-1.5
Prerequisites	**Prerequisites**
Corequisites	**Corequisites**

Notes	**Notes**
SpecialTopicDropdown	**SpecialTopicDropdown**
GradeSchemePF	**GradeSchemePF**
EffectonEnrolmentINIT	**EffectonEnrolmentINIT** *No*
EffectonEnrolmentOTHER	**EffectonEnrolmentOTHER** *NO*
AdditionalTeachingSpace	**AdditionalTeachingSpace** *No*
EffectonTeachingLoads	**EffectonTeachingLoads** *No*
EffectonServices	**EffectonServices** *No*
DirectinkindSupport	**DirectinkindSupport** *No*

4.	New Version of a Course	Engineering 4557 - Digital Communications

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 4557 - Digital Communications **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 4557 - Digital Communications **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 4557	**Code** Engineering 4557
Title Digital Communications	**Title** Digital Communications
Description Characteristics, performance and software issues of digital radio, telephone and computer networks. Coding and error controls in digital networks.	**Description** Characteristics, performance*,* and software issues of digital ~~radio, telephone~~ *communications* and computer networks. ~~Coding and error controls in digital networks~~*Topics include: networks and services, Internet protocols and socket programming, data compressions and coding, fundamental limit in information theory, error control, delay/loss performance*.
End Term No Specified End Date	**End Term** No Specified End Date
Institution Lakehead University	**Institution** Lakehead University
Faculty Faculty of Engineering	**Faculty** Faculty of Engineering
CreditWeight 0.5	**CreditWeight** 0.5
Rationale	**Rationale** *To update current course content.*
Requiredor Elective	**Requiredor Elective** Required
Cross List	**Cross List**
Offering 0-0; 3-1.5	**Offering** 0-0; 3-1.5
Prerequisites	**Prerequisites**
Corequisites	**Corequisites**

Notes	Notes
SpecialTopicDropdown	**SpecialTopicDropdown**
GradeSchemePF	**GradeSchemePF**
EffectonEnrolmentINIT	**EffectonEnrolmentINIT** *No*
EffectonEnrolmentOTHER	**EffectonEnrolmentOTHER** *No*
AdditionalTeachingSpace	**AdditionalTeachingSpace** *No*
EffectonTeachingLoads	**EffectonTeachingLoads** *No*
EffectonServices	**EffectonServices** *No*
DirectinkindSupport	**DirectinkindSupport** *No*

5.	New Version of a Course	Engineering 3050 - Software Engineering Design I

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 3050 - Software Engineering Design I **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 3050 - Software Engineering Design I **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 3050	**Code** Engineering 3050
Title Software Engineering Design I	**Title** Software Engineering Design I
Description A project oriented course in which students will apply software engineering principles to solve engineering problems.	**Description** A project oriented course in which students ~~will~~ apply software engineering principles *of requirements elicitation, specifications, design, implementation, and testing* to solve engineering problems. *The course focuses on object oriented methodology and the use of Unified Modeling Language (UML) to specify, visualize, construct, and document the artifacts of the software system.*
End Term No Specified End Date	**End Term** No Specified End Date
Institution Lakehead University	**Institution** Lakehead University
Faculty Faculty of Engineering	**Faculty** Faculty of Engineering
CreditWeight 0.5	**CreditWeight** 0.5
Rationale	**Rationale** *To update and expand on current course content.*
Requiredor Elective	**Requiredor Elective**
Cross List	**Cross List**
Offering 0-0; 1.5-3	**Offering** 0-0; 1.5-3
Prerequisites	**Prerequisites**
Corequisites	**Corequisites**
Notes	**Notes**

SpecialTopicDropdown	**SpecialTopicDropdown**
GradeSchemePF	**GradeSchemePF**
EffectonEnrolmentINIT	**EffectonEnrolmentINIT** *No*
EffectonEnrolmentOTHER	**EffectonEnrolmentOTHER** *No*
AdditionalTeachingSpace	**AdditionalTeachingSpace** *No*
EffectonTeachingLoads	**EffectonTeachingLoads** *No*
EffectonServices	**EffectonServices** *No*
DirectinkindSupport	**DirectinkindSupport** *No*

6.	New Version of a Course	Engineering 3051 - Software Engineering Design II

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 3051 - Software Engineering Design II **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 3051 - Software Engineering Design II **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 3051	**Code** Engineering 3051
Title Software Engineering Design II	**Title** Software Engineering Design II
Description A continuation of Engineering 3050 - Software Engineering Design I.	**Description** A continuation of Engineering 3050 - Software Engineering Design I. *A project oriented course in which the students demonstrate ability to apply software engineering principles to solve a real-life engineering problem. The students learn how to choose a proper software engineering methodology, develop project management planning, business model and potential safety and security issues in the design of software.*
End Term No Specified End Date	**End Term** No Specified End Date
Institution Lakehead University	**Institution** Lakehead University
Faculty Faculty of Engineering	**Faculty** Faculty of Engineering
CreditWeight 0.5	**CreditWeight** 0.5
Rationale	**Rationale** *To update and expand on current course content.*
Requiredor Elective	**Requiredor Elective** Required
Cross List	**Cross List**
Offering 1.5-3; 0-0	**Offering** 1.5-3; 0-0
Prerequisites	**Prerequisites**
Corequisites	**Corequisites**

Notes	**Notes**
SpecialTopicDropdown	**SpecialTopicDropdown**
GradeSchemePF	**GradeSchemePF**
EffectonEnrolmentINIT	**EffectonEnrolmentINIT** *No*
EffectonEnrolmentOTHER	**EffectonEnrolmentOTHER** *No*
AdditionalTeachingSpace	**AdditionalTeachingSpace** *No*
EffectonTeachingLoads	**EffectonTeachingLoads** *No*
EffectonServices	**EffectonServices** *No*
DirectinkindSupport	**DirectinkindSupport** *No*

7.	New Version of a Course	Engineering 3670 - Software Engineering

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 3670 - Software Engineering **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 3670 - Software Engineering **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 3670	**Code** Engineering 3670
Title Software Engineering	**Title** Software Engineering
Description Introduction to the concepts of software engineering: software life cycle, project planning, cost estimation, software specification, implementation verification and validation techniques, and software maintenance. Models for the development of software, software project management tools, quality control, risk assessment and management, roll-out plans, documentation.	**Description** Introduction to the concepts of software engineering: software life cycle, project planning ~~, cost~~ *and* estimation, *Computer Aided Software Engineering tools,* software *requirements elicitation, analysis and* specification, ~~implementation verification and validation~~ *design, implementation, testing* techniques, ~~and~~ software maintenance~~. Models for the development of software~~, ~~software project management tools, quality control,~~ risk assessment*,* and ~~management, roll-out plans,~~ documentation *standards*.
End Term No Specified End Date	**End Term** No Specified End Date
Institution Lakehead University	**Institution** Lakehead University
Faculty Faculty of Engineering	**Faculty** Faculty of Engineering
CreditWeight 0.5	**CreditWeight** 0.5
Rationale	**Rationale** *To update current course content.*
Requiredor Elective	**Requiredor Elective** Required
Cross List	**Cross List**
Offering 3-1; 0-0	**Offering** 3-1; 0-0
Prerequisites	**Prerequisites**

Corequisites	**Corequisites**
Notes	**Notes**
SpecialTopicDropdown	**SpecialTopicDropdown**
GradeSchemePF	**GradeSchemePF**
EffectonEnrolmentINIT	**EffectonEnrolmentINIT** *No*
EffectonEnrolmentOTHER	**EffectonEnrolmentOTHER** *No*
AdditionalTeachingSpace	**AdditionalTeachingSpace** *No*
EffectonTeachingLoads	**EffectonTeachingLoads** *No*
EffectonServices	**EffectonServices** *No*
DirectinkindSupport	**DirectinkindSupport** *No*

8.	New Version of a Course	Engineering 3255 - Software Design and Testing

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 3255 - Software Design and Testing **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 3255 - Software Design and Testing **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 3255	**Code** Engineering 3255
Title Software Design and Testing	**Title** Software Design and Testing
Description Language and automata theory for software engineers. Algorithms design, analysis and recurrence. Issues in software quality and reliability. Quality engineering, software reliability engineering, grey-box (Object Oriented) test strategy, product testing, test standards, verification and validation. Design validation and verification strategies.	**Description** ~~Language and automata theory for software engineers. Algorithms design, analysis and recurrence. Issues in software quality and reliability. Quality engineering, software reliability engineering, grey-box (Object Oriented) test strategy, product testing, test standards, verification and validation. Design validation and verification strategies.~~*This course introduces compiler and algorithm design, and software testing and quality assurance. Topics include: language and automata theory; algorithms design and analysis; software testing strategies and techniques, object oriented testing and metrics, software quality assurance; software quality engineering, software reliability engineering.*
End Term No Specified End Date	**End Term** No Specified End Date
Institution Lakehead University	**Institution** Lakehead University
Faculty Faculty of Engineering	**Faculty** Faculty of Engineering
CreditWeight 0.5	**CreditWeight** 0.5
Rationale	**Rationale** *To update current course content.*
Requiredor Elective	**Requiredor Elective** Required
Cross List	**Cross List**
Offering 0-0; 3-1.5	**Offering** 0-0; 3-1.5

Prerequisites	**Prerequisites**
Corequisites	**Corequisites**
Notes	**Notes**
SpecialTopicDropdown	**SpecialTopicDropdown**
GradeSchemePF	**GradeSchemePF**
EffectonEnrolmentINIT	**EffectonEnrolmentINIT** *No*
EffectonEnrolmentOTHER	**EffectonEnrolmentOTHER** *No*
AdditionalTeachingSpace	**AdditionalTeachingSpace** *No*
EffectonTeachingLoads	**EffectonTeachingLoads** *No*
EffectonServices	**EffectonServices** *No*
DirectinkindSupport	**DirectinkindSupport** *No*

9.	New Version of a Course	Engineering 3350 - Performance Analysis of Software

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 3350 - Performance Analysis of Software **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 3350 - Performance Analysis of Software **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 3350	**Code** Engineering 3350
Title Performance Analysis of Software	**Title** Performance Analysis of Software
Description Introduction to software performance and UML. Software performance engineering models. Software execution models. System execution models. Modeling of software architecture using message sequence charts, finite state machines and queuing networks. Performance oriented design. Performance testing. Performance solution. Performance tuning. Applications.	**Description** ~~Introduction~~ *This course introduces the basic principles of Software Performance Engineering (SPE). Topics include introduction* to software performance ~~and~~ *using* UML~~. Software~~ *, software* performance engineering models~~. Software~~ *, software* execution models~~. System~~ *, system* execution models~~. Modeling of software architecture using message sequence charts, finite state machines and queuing networks. Performance oriented design. Performance testing. Performance solution. Performance tuning. Applications.~~*, performance oriented design, performance testing, performance solution, performance tuning and applications.*
End Term No Specified End Date	**End Term** No Specified End Date
Institution Lakehead University	**Institution** Lakehead University
Faculty Faculty of Engineering	**Faculty** Faculty of Engineering
CreditWeight 0.5	**CreditWeight** 0.5
Rationale	**Rationale** *To update current course content.*
Requiredor Elective	**Requiredor Elective** Required
Cross List	**Cross List**
Offering 0-0; 3-1.5	**Offering** 0-0; 3-1.5
Prerequisites	**Prerequisites**

Corequisites	**Corequisites**
Notes	**Notes**
SpecialTopicDropdown	**SpecialTopicDropdown**
GradeSchemePF	**GradeSchemePF**
EffectonEnrolmentINIT	**EffectonEnrolmentINIT** *No*
EffectonEnrolmentOTHER	**EffectonEnrolmentOTHER** *No*
AdditionalTeachingSpace	**AdditionalTeachingSpace** *No*
EffectonTeachingLoads	**EffectonTeachingLoads** *No*
EffectonServices	**EffectonServices** *NO*
DirectinkindSupport	**DirectinkindSupport** *No*

10.	New Version of a Course	Engineering 2254 - Data Management and Information Systems

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 2254 - Data Management and Information Systems **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 2254 - Data Management and Information Systems **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 2254	**Code** Engineering 2254
Title Data Management and Information Systems	**Title** Data Management and Information Systems
Description Introduction to data management and information systems. Data modeling; relational model, Entity-Relationship modeling. Transformation of ER models to SQL. Basic queries in SQL. Data structures and storage. Database architectures and implementations; client/server systems, distributed databases, hierarchical and network models, object oriented models.	**Description** ~~Introduction to~~ *This course provides the student with the basic foundations of* data management and information systems. ~~Data~~ *Topics include: data* modeling; ~~relational model,~~ Entity-Relationship modeling~~. Transformation~~ *; relational model; basic queries in SQL; transformation* of ER models to SQL~~. Basic queries in SQL. Data structures and storage. Database architectures and implementations; client/server systems, distributed databases, hierarchical and network models, object oriented models~~*; database architectures; database implementation issues and applications*.
End Term No Specified End Date	**End Term** No Specified End Date
Institution Lakehead University	**Institution** Lakehead University
Faculty Faculty of Engineering	**Faculty** Faculty of Engineering
CreditWeight 0.5	**CreditWeight** 0.5
Rationale	**Rationale** *To update current course content.*
Requiredor Elective	**Requiredor Elective** Required
Cross List Business 3293	**Cross List** Business 3293
Offering 3-1.5; 0-0	**Offering** 3-1.5; 0-0

Prerequisites Business 2033 for students taking Business 3293	**Prerequisites** Business 2033 for students taking Business 3293
Corequisites	**Corequisites**
Notes Engineering students may only take Engineering 2254.	**Notes** Engineering students may only take Engineering 2254.
SpecialTopicDropdown	**SpecialTopicDropdown**
GradeSchemePF	**GradeSchemePF**
EffectonEnrolmentINIT	**EffectonEnrolmentINIT** *NO*
EffectonEnrolmentOTHER	**EffectonEnrolmentOTHER** *No*
AdditionalTeachingSpace	**AdditionalTeachingSpace** *No*
EffectonTeachingLoads	**EffectonTeachingLoads** *No*
EffectonServices	**EffectonServices** *No*
DirectinkindSupport	**DirectinkindSupport** *No*

Cross Listed Courses

CURRENT VERSION			PROPOSED VERSION		
Code	**Start Term**	**End Term**	**Code**	**Start Term**	**End Term**
Business 3293	Summer 2009	Spring 2010	Business 3293	Summer 2009	Spring 2010
Business 3293	Summer 2010	Spring 2011	Business 3293	Summer 2010	Spring 2011
Business 3293	Summer 2011	Winter 2012	Business 3293	Summer 2011	Winter 2012
Business 3293	Fall 2012	No Specified End Date	Business 3293	Fall 2012	No Specified End Date

11.	New Version of a Course	Engineering 4559 - Signal Processing for Software Engineers

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 4559 - Signal Processing for Software Engineers **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 4559 - Signal Processing for Software Engineers **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 4559	**Code** Engineering 4559
Title Signal Processing for Software Engineers	**Title** Signal Processing for Software Engineers
Description Sampling and linear time invariant systems and applications. Engineering applications of DFT and spectral analysis techniques. Introduction to signal detection and estimation theory with applications. Fundamental limit in information theory.	**Description** Sampling ~~and linear time invariant systems and applications. Engineering applications of DFT and spectral analysis techniques. Introduction to signal detection and estimation theory with applications. Fundamental limit in information theory~~*, filtering and analysis of signals and images in the spatial, Fourier, and Z domains. Applications in image enhancement and compression*.
End Term No Specified End Date	**End Term** No Specified End Date
Institution Lakehead University	**Institution** Lakehead University
Faculty Faculty of Engineering	**Faculty** Faculty of Engineering
CreditWeight 0.5	**CreditWeight** 0.5
Rationale	**Rationale** *To update current course content.*
Requiredor Elective	**Requiredor Elective** Required
Cross List	**Cross List**
Offering 3-1.5; 0-0	**Offering** 3-1.5; 0-0
Prerequisites	**Prerequisites**
Corequisites	**Corequisites**

Notes	**Notes**
SpecialTopicDropdown	**SpecialTopicDropdown**
GradeSchemePF	**GradeSchemePF**
EffectonEnrolmentINIT	**EffectonEnrolmentINIT** *No*
EffectonEnrolmentOTHER	**EffectonEnrolmentOTHER** *No*
AdditionalTeachingSpace	**AdditionalTeachingSpace** *No*
EffectonTeachingLoads	**EffectonTeachingLoads** *No*
EffectonServices	**EffectonServices** *No*
DirectinkindSupport	**DirectinkindSupport** *No*