DECISION ACADEMIC

Lakehead University
Faculty of Engineering

REQUEST REPORT

Request Tracking Number: 2013-ENG-2980
Request Title: Electrical ENGI 2014-2015 Course Changes

[DeAcTerm[EffectiveDate]] [DeAc[RequestEffectiveDate]]
Request Status: In Workflow
Request can't be split

Request Contents

Type		Title
1.	New Version of a Course	Electrical and Electronics Technology
2.	New Version of a Course	Computer Logic Circuits
3.	New Version of a Course	Communications Systems
4.	New Version of a Course	Digital VLSI Circuit Design
5.	New Version of a Course	Digital Signal Processing
6.	New Course	Computer Organization
7.	New Version of a Course	Control Systems III
8.	New Version of a Course	Topic in Electrical Engineering
9.	New Version of a Course	Advanced Electronic Devices
10.	New Version of a Course	Optical Communications
11.	New Version of a Course	Electric Circuit Theory II
12.	New Version of a Course	Electronics I
13.	New Version of a Course	Introduction to Microcontrollers
14.	New Version of a Course	Electronic Communications I
15.	New Version of a Course	Electric Machines I
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17.	New Version of a Course	Power Electronics I
18.	New Version of a Course	Electronic Communications II
19.	New Version of a Course	Electric Circuit Theory I
20.	New Version of a Course	Computer Communications and Networking
21.	New Version of a Course	Fuzzy Logic Expert Systems
22.	New Version of a Course	Electronics II

23.	New Version of a Course	Power Electronics II
24.	New Version of a Course	Control Systems II
25.	New Version of a Course	Electric Power Systems I
26.	New Version of a Course	Electric Machines II
27.	New Version of a Course	Microwave Circuits and Design
28.	New Version of a Course	Wireless Communications
29.	New Version of a Course	Electric Power Systems II

Request History

Workflow Step	Workflow Action	User	Change Made	Comments	Date
Initiator	Approved	Laura Parker	Yes	Submitted to workflow	12/19/2013
Dean and Faculty Council Review Stage	Approved	David Barnett	No	approved	01/13/2014

Supporting Documents

File Name	Uploaded By	Upload Date	Size

Supporting Documents Audit Trail

File Name	User	Date	Action

Notes

Date	User	Note

1.	New Version of a Course	Engineering 2151 - Electrical and Electronics Technology

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 2151 - Electrical and Electronics Technology **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 2151 - Electrical and Electronics Technology **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 2151	**Code** Engineering 2151
Title Electrical and Electronics Technology	**Title** Electrical and Electronics Technology
Description Fundamentals of D.C. and A.C. circuit analysis. Principles of D.C. and A.C. machines and transformers. Principles of operation of semiconductor diodes, transistor and silicon controlled rectifiers. Small signal amplifiers, operational amplifiers. Analog/digital converters and instrumentation techniques.	**Description** ~~Fundamentals of D.C. and A.C. circuit analysis. Principles of D.C. and A.C. machines and transformers. Principles of operation of semiconductor diodes, transistor and silicon controlled rectifiers. Small signal amplifiers, operational amplifiers. Analog/digital converters and instrumentation techniques~~*Basic electronic materials-physical concepts; semiconductor materials; principles of operation of semiconductor devices-diodes and transistors; fundamentals of DC and AC circuit analysis; concepts of magnetism; principles of DC and AC machines and transformers; safety considerations; operational amplifiers and their 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 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*

2.	New Version of a Course	Engineering 1637 - Computer Logic Circuits

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 1637 - Computer Logic Circuits **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 1637 - Computer Logic Circuits **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 1637	**Code** Engineering 1637
Title Computer Logic Circuits	**Title** Computer Logic Circuits
Description Switching algebra; gate functions; flip flops; registers and counters, sequential logic; number systems and binary arithmetic; codes; memory circuits; analog/digital conversion; sequencing circuits.	**Description** ~~Switching algebra; gate functions; flip flops; registers and counters, sequential logic; number systems and binary arithmetic; codes; memory circuits; analog/digital conversion; sequencing circuits~~*Introduction to fundamental concepts of digital logic circuits and design with Verilog HDL.Topics include principles of number systems, operations, codes, logic gates, Boolean algebra and logic simplification, PAL and PLD based combinational logic functions, synchronous and asynchronous logic circuits, state transition diagrams, latches, flip-flops, counters, shift registers, memory, Mealy and Moore finite state machines*.
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*

3.	New Version of a Course	Engineering 4053 - Communications Systems

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 4053 - Communications Systems **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 4053 - Communications Systems **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 4053	**Code** Engineering 4053
Title Communications Systems	**Title** Communications Systems
Description Spectral analysis, filters and matched filters, amplitude modulation, angle modulation, pulse modulation, analysis of noise in systems, data transmission, introduction to information theory.	**Description** ~~Spectral analysis, filters and matched filters, amplitude modulation, angle modulation, pulse modulation, analysis of noise in systems, data transmission, introduction to~~ *Continuous-wave modulation; noise in continuous-wave modulation; pulse modulation; baseband pulse transmission; passband digital transmission; fundamental limits from* information theory.
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 3-3; 0-0	**Offering** 3-3; 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*

4.	New Version of a Course	Engineering 4054 - Digital VLSI Circuit Design

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 4054 - VLSI Circuit Design **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 4054 - *Digital* VLSI Circuit Design **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 4054	**Code** Engineering 4054
Title VLSI Circuit Design	**Title** *Digital* VLSI Circuit Design
Description Digital CMOS VLSI circuit design; circuit design simulations using IEEE - VHDL; basic computer architecture and design of VLSI circuits to implement a computer architecture; design for testability and an introduction to concurrent system designs such as systolic arrays.	**Description** Digital CMOS VLSI circuit design~~; circuit design simulations using IEEE - VHDL~~*, layout and simulations*; basic computer architecture and design of VLSI circuits to implement ~~a computer~~ *the* architecture; design for testability~~ and an introduction to concurrent system designs such as systolic arrays~~.
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 title and description to reflect 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**

Engineering 4530 or permission of instructor	Engineering 4530 or permission of instructor
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 4632 - Digital Signal Processing

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 4632 - Digital Signal Processing **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 4632 - Digital Signal Processing **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 4632	**Code** Engineering 4632
Title Digital Signal Processing	**Title** Digital Signal Processing
Description Sampling. Z transforms. Properties of continuous and discrete linear systems. Digital filter and controller design. The Fast Fourier Transform. Fast convolution and correlation. Signals containing noise. Covariance and spectrum analysis.	**Description** ~~Sampling. Z transforms. Properties of continuous and discrete linear systems. Digital filter and controller design. The Fast Fourier Transform. Fast convolution and correlation. Signals containing noise. Covariance and spectrum analysis~~*Signal sampling; discrete–time signals and systems; frequency domain analysis; convolution and correlation; discrete-time Fourier transform; Z transform; Fast Fourier Transform; design of infinite and finite impulse response digital filters; spectrum analysis; 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 description to reflect current course content.*
Requiredor Elective	**Requiredor Elective** Required
Cross List	**Cross List**
Offering	**Offering** 0-0; 3-1.5

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*

6.	New Course	Engineering 0XXX - Computer Organization

Course Details

Engineering 0XXX - Computer Organization
Start Term: Fall 2014
End Term: No Specified End Date

Course Details

Code
Engineering 0XXX

Title
Computer Organization

Description
Architecture and performance of processors; performance metrics; instruction sets and their impact on performance; families of processors--CISC, RISC; datapath and controller for single-cycle and pipelined architectures; pipeline hazards; exception handling; integer and floating-point arithmetic units for processors; hardware description language; design and implementation of a single-cycle processor on FPGA; memory hierarchy design and basic cache memory organization; virtual memory and address translation.

End Term
No Specified End Date

Institution
Lakehead University

Faculty
Faculty of Engineering

CreditWeight
0.5

Rationale
To assign it's own course number to an elective course that has been previously offered under ENGI 0531, the topics courses.

Requiredor Elective
Elective

Cross List

Offering
3-1.5;3-1.5

Prerequisites

Corequisites

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

7.	New Version of a Course	Engineering 0138 - Control Systems III

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 0138 - Advanced Controls II **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 0138 - ~~Advanced Controls II~~*Control Systems III* **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 0138	**Code** Engineering 0138
Title Advanced Controls II	**Title** ~~Advanced Controls II~~*Control Systems III*
Description State space analysis of linear systems, linear quadratic regulators and full order observers, robustness issues in control design. Describing function analysis of nonlinear systems, jump resonance and dither. Digital control systems, implementation issues.	**Description** ~~State space analysis of linear systems, linear quadratic regulators and full order observers, robustness issues in control design. Describing function analysis of nonlinear systems, jump resonance and dither. Digital control systems, implementation issues.~~*Continuous-time state space representation for linear time-invariant systems; controllability and observability; feedback control design in state space--pole placement, linear quadratic regulator; linear state observers; observer-based state feedback design; discrete-time state space representation; discrete-time observer and control design; implementation issues; introduction to nonlinear systems; describing functions analysis and limit cycles.*
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 title and description to reflect current course content.*
Requiredor Elective	**Requiredor Elective** Elective

Cross List	Cross List
Offering 3-1.5; or 3-1.5	**Offering** 3-1.5; or 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*

8.	New Version of a Course	Engineering 0531 - Topic in Electrical Engineering

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 0531 - Topic in Electrical Engineering **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 0531 - Topic in Electrical Engineering **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 0531	**Code** Engineering 0531
Title Topic in Electrical Engineering	**Title** Topic in Electrical Engineering
Description Course material will be selected from one of the broad areas of either electrical power systems or electronics. The material will cover the theory and main design features of new devices and their application in equipment and systems.	**Description** ~~Course material will be~~ *A broad topic* selected from one of the ~~broad~~ areas of ~~either electrical power systems or electronics~~*Electrical Engineering*. The material will cover the theory and ~~main~~ design features of ~~new devices and their application in equipment and systems~~*the topic at an appropriate detail and depth*.
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 description to reflect a broader scope.*
Requiredor Elective	**Requiredor Elective** Elective
Cross List	**Cross List**
Offering 3-1.5; or 3-1.5	**Offering** 3-1.5; or 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 0654 - Advanced Electronic Devices

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 0654 - Advanced Electronic Devices **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 0654 - Advanced Electronic Devices **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 0654	**Code** Engineering 0654
Title Advanced Electronic Devices	**Title** Advanced Electronic Devices
Description The following topics will be discussed. Bipolar transistors and their applications in the microelectronic circuits. MOSFET transistors and their applications in the microelectronic circuits. MESFET and JFET transistors. Semiconductor lasers and their applications in the semiconductor integrated optoelectronics. Light emitting diodes, photo-diodes, and photo-transistors and their applications in optoelectronics. Tunnel diodes and their applications in the high-frequency circuits. Devices on semiconductor sandwich multi-structures. Integrated circuits on semiconductor compound alloys.	**Description** ~~The following topics will be discussed.~~ Bipolar transistors~~ and their applications in the microelectronic circuits. MOSFET transistors and their applications in the microelectronic circuits. MESFET and JFET transistors. Semiconductor~~ *, MOSFETs, MESFETs and JFETs; semiconductor* lasers and their applications in ~~the semiconductor integrated optoelectronics. Light~~ *optoelectronics; light* emitting diodes, photo-diodes, and photo-transistors and their applications~~ in optoelectronics. Tunnel~~ *; tunnel* diodes and their applications~~ in the high-frequency circuits. Devices~~ *; devices* on semiconductor sandwich multi-structures~~. Integrated~~ *; integrated* circuits on semiconductor compound alloys.
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 description to reflect current course content*
Requiredor Elective	**Requiredor Elective** Elective
Cross List	**Cross List**

Offering 3-1.5; or 3-1.5	**Offering** 3-1.5; or 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 0550 - Optical Communications

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 0550 - Optical Communications **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 0550 - Optical Communications **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 0550	**Code** Engineering 0550
Title Optical Communications	**Title** Optical Communications
Description Review of communication systems requirements and the place of optical communications in this. Basic optics. Light guides, connectors, and couplers. Practical considerations. Precautions to be taken to prevent eye damage when working with lasers. Electro-optical modulators, demodulators and couplers. Detailed analysis and study of an established optical communications system.	**Description** ~~Review of communication systems requirements and the place of optical communications in this. Basic optics. Light guides, connectors, and couplers. Practical considerations. Precautions to be taken to prevent eye damage when working with lasers. Electro-optical modulators, demodulators and couplers. Detailed analysis and study of an established optical communications~~ *Electromagnetic theory applied to optics. Optical waveguide design and characteristics. Design of passive and active optical components. Sources and detectors. Optical fiber systems: Detection and measurement techniques. Modulators and demodulators. Analysis and study of an optical communication* 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 description to reflect current course content.*
Requiredor Elective	**Requiredor Elective** Elective
Cross List	**Cross List**

Offering 3-1.5; or 3-1.5	**Offering** 3-1.5; or 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*

11.	New Version of a Course	Engineering 1536 - Electric Circuit Theory II

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 1536 - Electric Circuit Theory II **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 1536 - Electric Circuit Theory II **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 1536	**Code** Engineering 1536
Title Electric Circuit Theory II	**Title** Electric Circuit Theory II
Description Complex algebra applied to AC circuits; sinusoidal waveforms; rotating phasors; steady state response of RLC networks; complex impedances; series and parallel impedances; resonance; transformer action; circuit analysis techniques.	**Description** Complex algebra applied to AC circuits; sinusoidal waveforms; rotating phasors; steady state response of RLC networks; complex impedances; series and parallel impedances; resonance ~~; transformer action; circuit~~ *circuits; design of complex loads for maximum power transfer; Coupled inductive circuits and ideal transformers; single phase transformers and equivalent circuit; three phase circuits; circuit* analysis techniques.
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*

12.	New Version of a Course	Engineering 1634 - Electronics I

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 1634 - Electronics I **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 1634 - Electronics I **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 1634	**Code** Engineering 1634
Title Electronics I	**Title** Electronics I
Description Semiconductor materials; the p-n junction; diode circuits; rectifiers and power supplies; safety in the work place; bipolar junction transistors (BJT's) and field effect transistors (FET's); biasing circuits and stabilization; small signal amplifier analysis; multistage amplifiers; frequency response of small signal amplifiers.	**Description** Semiconductor ~~materials; the~~ *theory applied to* p-n ~~junction~~*junctions, bipolar and field effect transistors*; diode circuits; rectifiers ~~and power supplies~~; safety in the work place; ~~bipolar junction transistors (BJT's) and field effect transistors (FET's);~~ *transistor* biasing circuits and stabilization; small signal amplifier analysis; ~~multistage amplifiers;~~ frequency response of small signal amplifiers.
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*

13.	New Version of a Course	Engineering 1232 - Introduction to Microcontrollers

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 1232 - Introduction to Microprocessors **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 1232 - Introduction to ~~Microprocessors~~*Microcontrollers* **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 1232	**Code** Engineering 1232
Title Introduction to Microprocessors	**Title** Introduction to ~~Microprocessors~~*Microcontrollers*
Description Hardware and software aspects of micro-processors will be covered with emphasis on real time applications. Survey of microprocessor types available. Architecture and addressing structures. Instruction sets. Assembly language programming. Interrupt handling and priority. Memory interfacing. Serial and parallel input/output. Real time applications. Direct memory access devices, including discs.	**Description** Hardware and software aspects of ~~micro-processors will be covered with emphasis on real time applications. Survey of microprocessor types available. Architecture and addressing structures. Instruction sets. Assembly language programming. Interrupt handling and priority. Memory interfacing. Serial and parallel input/output. Real time applications. Direct memory access devices, including discs~~*microcontrollers and their applications in embedded systems; assembly language programming; architecture and addressing structures; serial and parallel input/output interfaces; timer programming; memory interfacing; interrupts and interrupt service routines; programming in C for microcontrollers; ADC, DAC and sensor interfacing*.
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 title and description to reflect 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*

14.	New Version of a Course	Engineering 2133 - Electronic Communications I

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 2133 - Communications I **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 2133 - *Electronic* Communications I **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 2133	**Code** Engineering 2133
Title Communications I	**Title** *Electronic* Communications I
Description Analysis and design of passive circuits. Baseband signal analysis. Noise. Amplitude modulation. Angle modulation. Single sideband modulation. Digital communications. Block schematics and main performance characteristics of radio receivers and transmitters. High voltage and radiation hazards associated with transmitters. Recommended safety precautions.	**Description** ~~Analysis and design of passive circuits. Baseband signal analysis. Noise. Amplitude modulation. Angle modulation. Single sideband modulation. Digital communications. Block schematics and main performance characteristics of radio receivers and transmitters. High voltage and radiation hazards associated with transmitters. Recommended safety precautions.~~*Basic concepts of electronic communications. Topics include spectral analysis of signals, communication filter basics, frequency generation and translation, analog modulation schemes-amplitude, phase and frequency modulations, sampling and quantization, introduction to digital communications and noise in communication systems.*
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 course title and description to reflect to 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*

15.	New Version of a Course	Engineering 2258 - Electric Machines I

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 2258 - Electric Machines I **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 2258 - Electric Machines I **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 2258	**Code** Engineering 2258
Title Electric Machines I	**Title** Electric Machines I
Description Safety measures to be taken in working with AC and DC machines. Magnetism and magnetic circuits. DC generators and motors with equivalent circuits. Excitation configurations and their application in motors and generators. Universal series motors and solid state control of DC motors. Three phase transformer configurations. Synchronous generators and motors with emphasis on power factor correction. Induction motor theory and application including single and three phase motors.	**Description** Safety measures ~~to be taken~~ in working with AC and DC machines~~. Magnetism and~~ *;* magnetic circuits~~. DC generators and motors with equivalent circuits. Excitation configurations and their application in motors and generators. Universal series motors and solid state~~ *; DC machine analysis; excitation configurations in DC machines; speed* control of DC motors~~. Three~~ *; three* phase transformer configurations~~. Synchronous generators and motors with emphasis on power factor correction. Induction motor theory and application including single and three phase motors~~*; three-phase and single phase induction motor analysis; synchronous machines--operation, equivalent circuits, torque and power calculations*.
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*

16.	New Version of a Course	Engineering 2438 - Control Systems I

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 2438 - Control Systems **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 2438 - Control Systems *I* **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 2438	**Code** Engineering 2438
Title Control Systems	**Title** Control Systems *I*
Description Dynamic response of the second-order servo mechanism. Transfer functions of system components. Bode plots and root-locus diagrams, analog controllers, simple process loops.	**Description** ~~Dynamic response of the second-order servo mechanism. Transfer functions of system components. Bode plots and root-locus diagrams, analog controllers, simple process loops~~*Introduction to control systems; signal properties, system properties; electro-mechanical mathematical modeling; time-domain analysis; Laplace transform applications; frequency domain analysis; steady-state responses and steady-state errors; stability; programmable logic controller*.
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 title and description to reflect course content.*
Requiredor Elective	**Requiredor Elective** Required
Cross List	**Cross List**
Offering	**Offering** 3-1.5; 0-0

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*

17.	New Version of a Course	Engineering 2430 - Power Electronics I

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 2430 - Electrical Control Devices and Applications **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 2430 - ~~Electrical Control Devices and Applications~~*Power Electronics I* **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 2430	**Code** Engineering 2430
Title Electrical Control Devices and Applications	**Title** ~~Electrical Control Devices and Applications~~*Power Electronics I*
Description Circuit analysis using Laplace transform; application to transients in RLC networks; principle of operation, characteristic, and rating of thyristors (SCR; TRIAC); phase control of resistive loads; trigger and timer circuits; commutation; thyristor protection; chopper circuits; D.C. motor control; inverter circuits; induction motor control; cycloconverters and synchronous motor control; power supplies.	**Description** ~~Circuit analysis using Laplace transform; application to transients in RLC networks; principle of operation, characteristic, and rating of thyristors (SCR; TRIAC); phase control of resistive loads; trigger~~ *Introduction to power semiconductor devices – structure, principles of operation and characteristics. Trigger* and timer circuits; commutation ~~; thyristor~~ *and* protection; *controlled and uncontrolled AC-DC converters and AC-AC cycloconverter voltage controllers; DC-DC* chopper circuits; ~~D.C.~~ *switch mode power supplies; DC* motor control; *DC-AC* inverter circuits; ~~induction~~ *AC* motor control ~~; cycloconverters and synchronous motor control;~~ *and uninterruptible* power supplies.
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 title and description to reflect 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*

18.	New Version of a Course	Engineering 2439 - Electronic Communications II

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 2439 - Communications II **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 2439 - *Electronic* Communications II **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 2439	**Code** Engineering 2439
Title Communications II	**Title** *Electronic* Communications II
Description The electro-magnetic wave spectrum from low radio frequencies up to and including optical frequencies. Hazards associated with radiative and inductive fields resulting from E.M. waves. Recommended safety precautions. Transmission lines. Waveguides. Radio wave propagation. Antennas. Satellite communications. Fibre-optic communications.	**Description** ~~The electro-magnetic wave spectrum from low radio frequencies up to and including optical frequencies. Hazards associated with radiative and inductive fields resulting from E.M. waves. Recommended safety precautions. Transmission lines. Waveguides. Radio wave propagation. Antennas. Satellite communications. Fibre~~*Basic concepts of electronic communications. Topics include transmission lines, radio wave propagation, antennas, communication link analysis, hazards and safety precautions, basic principles of satellite and fiber*-optic communications.
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 title and description to reflect current course content.*
Requiredor Elective	**Requiredor Elective** Required
Cross List	**Cross List**
Offering	**Offering**

0-0; 3-1.5	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*

19.	New Version of a Course	Engineering 1236 - Electric Circuit Theory I

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 1236 - Electric Circuit Theory I **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 1236 - Electric Circuit Theory I **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 1236	**Code** Engineering 1236
Title Electric Circuit Theory I	**Title** Electric Circuit Theory I
Description Fundamentals of circuit analysis; network theorems; properties of resistors, capacitors and inductors; transients in RL and RC networks.	**Description** Fundamentals of *electromagnetism and* circuit analysis; network theorems; properties of resistors, capacitors and inductors; transients in RL and RC networks*; introductory magnetic circuits and ideal op-amp circuit analysis*.
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*

20.	New Version of a Course	Engineering 2453 - Computer Communications and Networking

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 2453 - Computer Communications and Networking **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 2453 - Computer Communications and Networking **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 2453	**Code** Engineering 2453
Title Computer Communications and Networking	**Title** Computer Communications and Networking
Description Network architecture; standard organizations; error concepts; data-link control; flowing control, and central grid routing; overview of internetworking; protocols and bridges.	**Description** ~~Network~~ *Layered protocol* architecture; ~~standard organizations; error concepts;~~ data-link control ~~;~~ ~~flowing~~ *including error* control ~~, and central grid routing; overview of internetworking; protocols and bridges~~*and flow control; circuit switching and packet switching; bridging and routing; local area networks, internetworking; TCP/IP architecture and addressing structure; network management*.
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 description to reflect current course content*
Requiredor Elective	**Requiredor Elective** Required
Cross List Business 3253	**Cross List** ~~Business 3253~~
Offering 0-0; 3-1.5	**Offering** 0-0; 3-1.5

Prerequisites Business 2033 for students taking Business 3253	**Prerequisites** ~~Business 2033 for students taking Business 3253~~
Corequisites	**Corequisites**
Notes Engineering students may only take Engineering 2453.	**Notes** ~~Engineering students may only take Engineering 2453.~~
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		
Course Detail	**Start Term**	**End Term**	**Course Detail**	**Start Term**	**End Term**
Business 3253 Business Data Communications	Summer 2009	Spring 2010	Business 3253 Business Data Communications	Summer 2009	Spring 2010
Business 3253 Business Data Communications	Summer 2010	Spring 2011	Business 3253 Business Data Communications	Summer 2010	Spring 2011
Business 3253 Computer Communications and Networking	Summer 2011	Winter 2012	Business 3253 Computer Communications and Networking	Summer 2011	Winter 2012
Business 3253 Computer Communications and Networking	Fall 2012	No Specified End Date	Business 3253 Computer Communications and Networking	Fall 2012	No Specified End Date

21.	New Version of a Course	Engineering 0573 - Fuzzy Logic Expert Systems

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 0573 - Fuzzy Logic Expert Systems **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 0573 - Fuzzy Logic Expert Systems **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 0573	**Code** Engineering 0573
Title Fuzzy Logic Expert Systems	**Title** Fuzzy Logic Expert Systems
Description The course deals with principles of Fuzzy Logic and fundamentals of expert systems. Topics include components of expert systems, operations on fuzzy sets, linguistic variables, fuzzy implications, compositional rule of inference, approximate reasoning techniques, multivariable inference engines, fast fuzzy inference engines, rule-based learning systems, fuzzy logic-based microprocessors, applications in Engineering Sciences and consumer electronics. The course is organized as a design-intensive procedure for intelligent systems.	**Description** ~~The course deals with principles of Fuzzy Logic and fundamentals of expert systems. Topics include components of expert systems,~~ *Components of expert systems;* operations on fuzzy sets~~,~~*;* linguistic variables~~,~~*;* fuzzy implications~~,~~*;* compositional rule of inference~~,~~*;* approximate reasoning techniques~~, multivariable~~*;* inference engines~~, fast fuzzy inference engines,~~*;* rule-based learning systems~~, fuzzy logic-based microprocessors, applications in Engineering Sciences~~*; fuzzy controller design; applications in engineering sciences* and consumer electronics.~~ The course is organized as a design-intensive procedure for intelligent systems.~~
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 description to reflect current course content.*
Requiredor Elective	**Requiredor Elective** Elective
Cross List	**Cross List**

Offering 3-1.5; or 3-1.5	**Offering** 3-1.5; or 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*

22.	New Version of a Course	Engineering 2132 - Electronics II

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 2132 - Electronics II **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 2132 - Electronics II **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 2132	**Code** Engineering 2132
Title Electronics II	**Title** Electronics II
Description Differential amplifiers; operational amplifiers (OP Amps); OP Amp applications; negative feedback amplifiers; positive feedback and oscillators; waveform generators and relaxation oscillators; class A and class B power amplifiers; heat sinking; electronic votage regulators; photo diodes; photo transistors and solar cells.	**Description** ~~Differential~~ *Multistage and differential* amplifiers; ~~operational~~ *power* amplifiers ~~(OP Amps)~~; ~~OP Amp applications;~~ negative feedback amplifiers ~~; positive feedback~~ and oscillators; ~~waveform generators and relaxation oscillators; class A and class B power amplifiers; heat sinking; electronic votage regulators; photo diodes; photo transistors and solar cells~~*heat sinking; voltage regulators and power supplies; introduction to opto-electronic 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 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*

23.	New Version of a Course	Engineering 0554 - Power Electronics II

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 0554 - Power Electronics **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 0554 - Power Electronics *II* **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 0554	**Code** Engineering 0554
Title Power Electronics	**Title** Power Electronics *II*
Description A course on the analysis and applications of power electronics circuits with thyristors and power transistors. The emphasis is on the steady-state performance and operating characteristics of such circuits. Design aspects of single- and multi-phase inverters, and dc-to-dc converters will be considered.	**Description** ~~A course on the analysis and applications of power electronics circuits with thyristors and power transistors. The emphasis is on the steady-state performance and operating characteristics of such circuits. Design aspects of single- and multi-phase inverters, and dc-to-dc converters will be considered~~*Switching losses and snubbers for semiconductor devices; analysis of uncontrolled and controlled single and three phase rectifiers; design, analysis and control of DC-DC converters; single and three phase inverters; dynamic modeling of DC motor drives; introduction to AC motor drives*.
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 title and description to reflect current course content.*
Requiredor Elective	**Requiredor Elective** Elective
Cross List	**Cross List**

Offering 3-1.5; or 3-1.5	**Offering** 3-1.5; or 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*

24.	New Version of a Course	Engineering 3334 - Control Systems II

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 3334 - Advanced Controls I **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 3334 - ~~Advanced Controls I~~*Control Systems II* **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 3334	**Code** Engineering 3334
Title Advanced Controls I	**Title** ~~Advanced Controls I~~*Control Systems II*
Description Review of Bode graphs, Nichols charts and stability criteria. Classical feedback control system theory employing operational calculus. Mathematical models of systems, transfer functions; poles and zeros; block diagrams and signal flow graphs. Feedback control system dynamics and transient responses. System performance criteria. Design of control system using root-locus methods. The stability of linear feedback systems.	**Description** ~~Review of Bode graphs, Nichols charts and stability criteria. Classical feedback control system theory employing operational calculus. Mathematical models of systems, transfer functions; poles and zeros; block diagrams and signal flow graphs. Feedback control system dynamics and transient responses. System performance criteria. Design of control system using root-locus methods. The stability of linear feedback systems~~*Transfer functions; block diagram simplification; realization of transfer functions using operational amplifiers; stability and performance of feedback systems; principle of dominant poles; stability analysis and control design using Routh-Hurwitz and root locus; PID design and implementation using operational amplifiers; frequency response-Bode and Nyquist plots; frequency response based stability analysis and control design-Lead and Lag compensators*.
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 change title and update to reflect the 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*

25.	New Version of a Course	Engineering 2451 - Electric Power Systems I

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 2451 - Electric Power Systems **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 2451 - Electric Power Systems *I* **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 2451	**Code** Engineering 2451
Title Electric Power Systems	**Title** Electric Power Systems *I*
Description An introduction to electrical power generating systems covering basic components. Alternators, three-phase voltage systems and transmission lines. The per unit method of normalizing power system quantities for fault analysis. Hazardous aspects of faults. Results of fault studies are used to discuss relaying and protection in power systems.	**Description** ~~An introduction to electrical power generating systems covering basic components. Alternators~~*Introduction to basic components of power systems and their models such as transmission lines*, three-phase ~~voltage systems and transmission lines~~*transformers, synchronous generators*. The per unit ~~method of normalizing power system quantities for fault analysis. Hazardous aspects of faults. Results of fault studies are used to discuss relaying and protection in power systems~~*system; power systems calculations; symmetrical fault analysis of power systems; introduction to unsymmetrical faults; hazardous aspects of faults; application of fault studies to power system protection using relays and circuit breakers*.
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 title and description to reflect 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*

26.	New Version of a Course	Engineering 4258 - Electric Machines II

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 4258 - Electric Machines II **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 4258 - Electric Machines II **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details	
CURRENT VERSION	**PROPOSED VERSION**
Code Engineering 4258	**Code** Engineering 4258
Title Electric Machines II	**Title** Electric Machines II
Description Magnetic circuit and energy storage systems. Electromechanical energy-conversion principles; development of electric machine equations using magnetomotive forces and flux linkages. Analysis of direct current and alternating current machinery. Transient processes in electric machines. Hazardous aspects of faults; recommended safety precautions.	**Description** Magnetic circuit and energy storage systems~~.~~ ~~Electromechanical~~ *; electromechanical* energy-conversion principles; development of ~~electric machine equations using magnetomotive forces and flux linkages. Analysis of direct current and alternating current machinery. Transient~~ *dynamic equations for electro-mechanical systems; analysis of electric machines; transient* processes in electric machines~~. Hazardous~~ *; speed/position controller design for D.C. motors; hazardous* aspects of *electrical* faults; ~~recommended~~ safety precautions*; introduction to electrical codes for electric machines*.
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*

27.	New Version of a Course	Engineering 0150 - Microwave Circuits and Design

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 0150 - Microwave Circuits and Design **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 0150 - Microwave Circuits and Design **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 0150	**Code** Engineering 0150
Title Microwave Circuits and Design	**Title** Microwave Circuits and Design
Description General discussion on the electro-magnetic fields associated with microwaves; radiation hazards and recommended safety precautions; electromagnetic wave equations; transmission and reflection at boundaries; factors affecting propagation in microwave communications systems; transmission lines and waveguides; design of networks utilizing transmission line sections; waveguide components; scattering parameters; design of small signal amplifiers; microwave switching diodes; microwave power sources.	**Description** ~~General discussion on the~~ *Microwave* electro-magnetic fields ~~associated with microwaves~~; ~~radiation~~ *antennas;* hazards and ~~recommended~~ safety precautions; ~~electromagnetic wave equations;~~ transmission ~~and reflection at boundaries; factors affecting propagation in microwave communications systems; transmission~~ lines and waveguides; design of *microwave matching* networks ~~utilizing transmission line sections~~; ~~waveguide components;~~ scattering parameters; *active microwave circuits;* design of ~~small signal~~ *microwave* amplifiers; ~~microwave switching diodes; microwave power sources~~*power dividers and directional couplers*.
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 description to reflect current course content.*
Requiredor Elective	**Requiredor Elective** Elective
Cross List	**Cross List**

Offering 0-0; 3-1.5	**Offering** ~~0~~*3*-~~0~~*1.5*; 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*

28.	New Version of a Course	Engineering 0578 - Wireless Communications

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 0578 - Wireless Personal Communications **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 0578 - Wireless ~~Personal~~ Communications **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 0578	**Code** Engineering 0578
Title Wireless Personal Communications	**Title** Wireless ~~Personal~~ Communications
Description Overview of wireless personal communication systems (PCS); characterization of wireless channel; digital modulation/demodulation techniques for wireless applications and its application to PCS; system architecture; FDMA, TDMA, CDMA; multiple access/resource allocation techniques of wireless medium resources; architecture of personal communication networks; interconnection between wireless/wired networks and future developments.	**Description** ~~Overview~~ *Basic principles* of wireless ~~personal communication systems (PCS);~~ *communications. Topics include* characterization of wireless ~~channel;~~ *channels,* digital modulation ~~/demodulation techniques~~ *and channel coding schemes* for wireless ~~applications and its application to PCS; system architecture; FDMA, TDMA, CDMA; multiple access/resource allocation techniques of wireless medium resources; architecture of personal communication networks; interconnection between wireless/wired networks and future developments~~*systems, spread-spectrum and multiple-access techniques and multicarrier communications. Emerging techniques of wireless communications*.
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 description and title to reflect current course content.*
Requiredor Elective	**Requiredor Elective** Elective

Cross List	Cross List
Offering 0-0; 3-1.5	**Offering** ~~0~~*3*-~~0~~*1.5*; 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*

29.	New Version of a Course	Engineering 0438 - Electric Power Systems II

Course Details

CURRENT VERSION	PROPOSED VERSION
Engineering 0438 - Power System Analysis and Design **Start Term:** Fall 2012 **End Term:** No Specified End Date	Engineering 0438 - ~~Power System Analysis and Design~~*Electric Power Systems II* **Start Term:** Fall ~~2012~~*2014* **End Term:** No Specified End Date

Course Details

CURRENT VERSION	PROPOSED VERSION
Code Engineering 0438	**Code** Engineering 0438
Title Power System Analysis and Design	**Title** ~~Power System Analysis and Design~~*Electric Power Systems II*
Description Safety measures related to high voltage transmission network are addressed. Introduction to power system components. Power system protection, transient and steady state stability, load flow analysis, fault calculations, and direct current transmission.	**Description** ~~Safety measures related to high voltage transmission network are addressed. Introduction to power system components. Power system protection,~~ *Power system components; load flow analysis;* transient and steady-state stability ~~, load flow~~ analysis~~,~~*;* fault calculations~~, and direct current transmission~~*; safety; power system coordination and protection*.
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 title and description to reflect current course content.*
Requiredor Elective	**Requiredor Elective** Elective
Cross List	**Cross List**
Offering 3-1.5; or 3-1.5	**Offering** 3-1.5; or 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*