Items Approved by Education Council
March 7, 2019

Executive: J Hamilton, A Hay, C Kushner, C Morcom
Deans: P Ashman, E Corneau, B Gillett, R Huxtable, J Lister, S Moores, Y Moritz, J Ragsdale
Associate Deans: T Kisilevich**,** L Kraft, LThurnheer, S Josephson, K Sansom, B McGillivray, J Rouse
Continuing Studies: D Silvestrone
Administrative Assistants: E Avis, J Campbell, L Foster, A Harden, P Heinzelmann, K Hojnocki, L Jennings, L Kohout, L Le Gallee, A March, J McGee, L Plamondon, M Scharf, J Smeyers, T Tuck, M Walker
International Education: R Boris
Registrar's Office: B Burge, A Hickey, L Rozniak, C Schneider, K Otke, I Wheeler
Public Affairs: A Coyle
Library: R Tyner
Student Services: J Coble
OC Students Society: Presidents, OC Student Union and Vernon Student Association
Education Council: C Newitt, D Marques

Trade and Apprenticeship Programs

Recreational Vehicle Service Technician Foundation
New program
Rationale:
The program is updating based on the new ITA outline for level one.
Program description:
This 31-week (950 hour) has been designed to take a student with little or no previous experience and supply him/her with the necessary skills to seek employment as an apprentice RV Service Technician. The program exposes the student to many aspects of servicing and repair in the RV repair trade with a focus on developing practical skills. Graduates of this program will receive credit for Level 1 Apprenticeship technical training and 550 hours practical credit from the Industry Training Authority.
Admission requirements:
English 10 with a minimum 50% or alternatives
Math requirement: a minimum of 50% in any of:

- Pre-calculus Grade 11
- Workplace Mathematics Grade 11
- Principles of Mathematics 11
- Applications of Mathematics 11
- Essentials of Mathematics 11
- Adult Basic Education MATH 011
- Adult Basic Education MATH 084 and MATH 085
- Adult Basic Education IALG 011

Or a minimum of 63% on the ABLE mathematics test. Test scores are only good for two (2) years. Applicants who have not satisfied the Math requirement within the last seven (7) years must write the ABLE Mathematics test and must receive a minimum of 63%.
Graduation requirements:
RVST 113 Industry Work Placements students must receive a "Pass" grade. Minimum passing grade is a minimum GGA of seventy percent (70%).
Program outline:
RVST 100 Perform Safety-related Activities

This course introduces students to safety practices that are required in recreational vehicle service and repair shop environment. Students will use and demonstrate safety practices.

RVST 101 Use Tools, Equipment

This course introduces students to tools and equipment that are found and used in recreational vehicle service and repair shop environment. Students will operate tools and equipment that are found in a recreational vehicle service shop environment.

RVST 102 Perform Common Work Practices

This course introduces students to common skills and pre-delivery inspections that are required in a recreational vehicle service and repair shop. Students will use and demonstrate common skills and predelivery inspections.

RVST 103 Service Water Systems

This course introduces students to water systems. Students will service and repair water systems.

RVST 104 Service Electrical Systems

This course introduces students to recreational vehicle electrical systems and components. Students will service and repair electrical systems and components.

RVST 105 Service Liquid Petroleum (LP) Gas Systems

This course introduces students to liquid petroleum (LP) systems found in recreational vehicles. Students will service and repair liquid petroleum systems and components.

RVST 106 Service Water Heaters

This course introduces students to recreational vehicle specific water heater systems. Students will service and repair recreational vehicle specific water heater systems.

RVST 107 Service Furnaces

This course introduces students to recreational vehicle specific furnace systems. Students will service and repair recreational vehicle specific furnace systems.

RVST 108 Service Cooktops and Ovens

This course introduces students to recreational vehicle specific cooktops and oven systems. Students will service and repair recreational vehicle specific cooktops and oven systems.

RVST109 Service Refrigerators

This course introduces students to recreational vehicle specific refrigerator systems. Students will service and repair recreational vehicle specific refrigerator systems.

RVST 110 Service Air Conditioners (A/C), Refrigeration and Heat Pumps

This course introduces students to recreational vehicle specific air conditioners (A/C), refrigeration and heat pump systems. Students will service and repair recreational vehicle specific air conditioners (A/C), refrigeration and heat pump systems.

RVST 111 Service Chassis and Mechanical Components

This course introduces students to recreational vehicle chassis and mechanical components. Students will diagnose and service recreational vehicle chassis and mechanical components.

RVST 112 Service Towing Systems

This course introduces students to recreational vehicle towing systems. Students will diagnose and service recreational towing systems.

RVST 113 Industry Work Placement

Students will be assigned to an employer for a two-week period where they will have the opportunity to demonstrate their skills acquired throughout the program. Assessment will be provided by the employer and input will be given by the instructor as well.

RVST 114 Final Exam

This course will provide the student with the curriculum review required to successfully complete the final exam. Students will conduct a review of the program curriculum and write the final exam. The review will prepare students to complete the RVST 1 SLE exam invigilated by the ITA.

Implementation date: September 2019

Cost: N/A

Carpenter Foundation
New program
Rationale:
To align with the Harmonized ITA outline.
Program description:
This 30-week (900 hours) program provides students with the necessary theoretical and practical knowledge to seek employment as an apprentice carpenter in the construction industry. The program introduces students to all aspects of the trades including the use of hand tools, portable power tools and other equipment used by carpenters. Through the construction of a residential wood-frame project students are given the opportunity to work with a variety of materials used by carpenters including lumber, panel products, concrete, fasteners and hardware. The focus is on developing practical skills for the construction workplace. Upon successful completion of this program, graduates will receive Level 1 technical training credit and 450 work-based-hours credit towards completion of the Carpenter Level 1 apprenticeship program.
Admission requirements:
B.C. secondary school graduation, or equivalent, or 19 years of age and out of secondary school for at least one year as of the first day of classes.
English 10 with minimum 50% or alternatives.
Math requirement: a minimum of 50% in any of

- Pre-calculus Grade 11
- Workplace Mathematics Grade 11
- Principles of Mathematics 11
- Applications of Mathematics 11
- Essentials of Mathematics 11
- Adult Basic Education MATH 011
- Adult Basic Education MATH 084 and MATH 085
- Adult Basic Education IALG 011

Or a minimum of 63% on the ABLE mathematics test. Test scores are only good for two (2) years. Applicants who have not satisfied the Math requirement within the last seven (7) years must write the ABLE Mathematics test and must receive a minimum of 63%.
Graduation requirements:
An overall average of 70% calculated on a weighted percentage, based on time allocation.
Program outline:
CAFD 101 Use Safe Work Practices
This course introduces the learner to a variety of scoop hazards and to the Worksafe BC and WHMIS regulations, including identifying roles and responsibilities related to workplace safety, describing hazards in the workplace, using personal protective equipment and clothing, applying personal safe work practices, and using fall protection.
CAFD 102 Documentation and Organizational Skills
This course introduces the learner to different types of drawings. The learner will also extract information from a set of construction drawings and will use instruments to create working drawings.
CAFD 103 Tools and Equipment
This course introduces the learner to the safe use and handling of hand tools, including measuring and layout tools, cutting boring tools, and fastening tools. Portable power tools would include: portable circular saws, mitre saws, drills, drivers, and pneumatic tools. Stationary Power tools would include: table saws, bench grinders, band saws, jointers, drill presses, thickness planers, and sanding machines.
CAFD 104 Survey Instruments and Equipment
In this course the learner will describe leveling equipment, use leveling equipment, and maintain leveling equipment.
CAFD 105 Access, Rigging and Hoisting Equipment
In this course the learner will describe and use ladders and access equipment, and describe cranes, hoists, and safe lifting methods. The student will also describe and use rigging and hoisting equipment.
CAFD 106 Site Layout
In this course the learner will describe excavations, grading procedures, and survey markers. The learner will also build batter boards.
CAFD 107 Concrete Formwork
In this course the learner will describe: concrete and its uses, formwork and falsework, material and hardware, concrete joints, footing forms, wall forms, column forms, slabs on grade, concert reinforcement,

and embeds. The student will plan and build: footing, wall, and column forms. The student will also calculate concrete volumes.
CAFD 108 Wood Frame Construction
In this course the learner will describe: framing systems, framing members, roof styles, terms used in frame construction, characteristics of wood, fasteners, and hardware used in wood frame construction. The learner will also describe, plan, calculate and build a wall and floor system. The learner will also plan, calculate and build a straight flight of stairs. The learner will also describe and plan a deck system.
CAFD 109 Building Science
In this course the learner will describe forces acting on a building.
CAFD 110 Final Exam
Implementation date: July 2019
Cost: N/A

Carpenter and Joiner Foundation
New program
Rationale:
To align with the Harmonized ITA outline.
Program description:
Students enrolled in the 30-week (900 hours) Carpenter and Joiner Foundation program will learn the skills required to seek employment in the trades of carpentry and joinery. The will develop the skills needed to begin working as carpentry or joinery apprentices. Graduates of this program will receive credit for Level 1 Apprenticeship technical training for both Carpentry and Joinery and may also be granted practical credit from the Industry Training Authority (ITA).
On Successful registration and sponsorship into an apprenticeship program, the IA will requires that graduates choose which apprenticeship pathway they intend to pursue.
Admission requirements:
B.C. secondary school graduation, or equivalent, or 19 years of age and out of secondary school for at least one year as of the first day of classes.
English 10 with minimum 50% or alternatives.
Math requirement: a minimum of 50% in any of

- Pre-calculus Grade 11
- Workplace Mathematics Grade 11
- Principles of Mathematics 11
- Applications of Mathematics 11
- Essentials of Mathematics 11
- Adult Basic Education MATH 011
- Adult Basic Education MATH 084 and MATH 085
- Adult Basic Education IALG 011

Or a minimum of 63% on the ABLE mathematics test. Test scores are only good for two (2) years.
Applicants who have not satisfied the Math requirement within the last seven (7) years must write the ABLE Mathematics test and must receive a minimum of 63%.
Graduation requirements:
An overall average of 70% calculated on a weighted percentage, based on time allocation.
Program outline:
CJFD 101 Use Safe Work Practices
This course introduces the learner to a variety of shop hazards and to the Worksafe BC and WHMIS regulations, including identifying roles and responsibilities related to workplace safety, describing hazards in the workplace, using personal protective equipment and clothing, applying personal safe work practices, and using fall protection.
CJFD 102 Documentation and Organizational Skills
This course introduces the learner to different types of drawings. The learner will also learn to extract information from a set of construction drawings and will use instruments to create work drawings.
CJFD 103 Select Materials
This course introduces the learner to the structure and properties of wood, species identification, production and grading, panel products, adhesives, fasteners and hardware, specialty materials, and materials handling.

CJFD 104 Tools and Equipment
This course introduces the learner to the safe use and handling of hand tools, including measuring and layout tools, cutting boring tools, and fastening tools. Portable power tools would include: portable circular saws, mitre saws, drills and drivers, and pneumatic tools. Stationary Power tools would include: table saws, bench grinders, band saws, jointers, drill presses, thickness planers, and sanding machines.
CJFD 105 Survey Instruments and Equipment
In this course the learner will describe leveling equipment, use leveling equipment, and maintain leveling equipment.
CJFD 106 Access, Rigging and Hoisting Equipment
In this course the learner will describe and use ladders and access equipment, and describe cranes, hoists, and safe lifting methods. The learner will also describe and use rigging and hoisting equipment.
CJFD 107 Site Layout
In this course the learner will describe excavations, grading procedures and survey markers. The learner will also build batter boards.
CJFD 108 Concrete Formwork
In this course the learner will describe: concrete and its uses, formwork and falsework, material and hardware, concrete joints, footing forms, wall forms, column forms, slabs on grade, concrete reinforcement, and embeds. The student will plan and build: footing, wall, and column forms. The learner will also calculate concrete volumes.
CJFD 109 Wood Frame Construction
In this course the learner will describe: framing systems, framing members, roof styles, terms used in frame construction, characteristics of wood, fasteners, and hardware used in wood frame construction. The learner will describe, plan, calculate and build a wall and floor system. The learner will also describe and plan a deck system.
CJFD 110 Building Science
In this course the learner will describe forces acting on a building.
CJFD 111 Assemble Products
This course introduces the learner to the use of handclamps, preparation for assembly, assembly procedures, and preparation for shipping.
CJFD 112 Apply a Finish
This course introduces the learner to prefinishing repairs, abrasives, sanding aids, and techniques.
CJFD 113 Final Exam
Implementation date: July 2019
Cost: N/A

Arts and Foundational Programs

CMNS 120 – 3 – 3 Introduction to Journalism Studies
Course revision:

- **Course title:** new title **– Journalism Fundamentals**
- **Calendar description**
- **Course content**
- **Contact hours**

Rationale:
The lecture - lab structure will allow students to learn basic journalism writing skills in addition to journalism theory. The theory component is further streamlined in relation to other first year media studies courses required in the diploma (e.g. CMNS 110, CMNS 130).
Calendar description:
Existing:
This course examines the history of journalism, the evolution of the role of the journalist in society, and the interrelationship between the practice of journalism and the broader social, cultural, political, and economic structures of society. Students will explore issues concerning the decline of the public sphere, and claims for its reinvention through participatory digital means. They will also learn, and begin to practice, a range of journalistic writing styles. Students will leave the class armed with the critical tools necessary to engage in discussions regarding the history, present condition and future of journalism.
Proposed:
This course examines the history and practice of journalism, the evolution of the role of the journalist, and the relationship between the practice of journalism and the broader social, cultural, political and economic context. Students will practice writing basic news stories for a wide variety of news sources and will leave equipped with basic techniques in news gathering and news writing.
Course content:
Key theories on journalism studies are still maintained in the lecture component but general media studies theories are eliminated (e.g. propaganda theories covered in CMNS 110 or digital media theories, covered in CMNS 130). Journalism theory is applied to news gathering techniques, news writing and basic interviewing skills via labs.
Contact hours:

	Existing	Proposed
Lecture	3	2
Lab	0	2
Average weekly contact hours	3	4

Implementation date: September 2019
Cost: N/A

Communications, Culture and Journalism Studies
Program revision:

- **Revision of courses**
- **Graduation requirements**
- **Resequencing of courses/ program outline**

Rationale:
This program revision introduces fundamental journalism writing skills and digital media studies basic competencies that more adequately can prepare students for potential entry-level jobs as described in the last paragraph of the existing program description. CMNS 120 is revised. CMNS 130 is becoming mandatory as opposed to an optional breadth course. The Science requirements are revised to meet the major transfer points for the diploma that is from 3 required Science to 2 required Science courses. Advisors also recommended that we revise the current Science summary as it creates confusion for students.
Revision of courses:
CMNS 120

Graduation requirements:

Existing	Proposed
The Diploma in Communications, Culture, and Journalism Studies will be granted upon the successful completion of 60 prescribed compulsory and elective credits, as follows (see below for details): eighteen credits in Communications credits, nine credits in English, fifteen Breadth credits, nine Arts Electives credits, and nine Science credits.	The Diploma in Communications, Culture, and Journalism Studies will be granted upon the successful completion of 60 prescribed compulsory and elective credits, as follows (see below for details): twenty-one credits in Communications credits, nine credits in English, fifteen Breadth credits, nine Arts Electives credits, and six Science credits.

Resequencing of courses/ program outline:

Existing	Proposed
Year One Foundational courses All of: CMNS 100, CMNS 110, CMNS 120, ENGL 100, ENGL 153 Breadth courses Three of: ANTH 121, CMNS 160 or CMNS 130, GEOG 128, HIST 122 or HIST 125, INDG 100, PHIL 114, POLI 101 or POLI 111, SOCI 111, GSWS 100 Year 2 Foundational courses Three of: CMNS 200, CMNS 230, CMNS 235 or ENGL 235, CMNS 240, CMNS 250, CMNS 260, CMNS 270, CMNS 280, CMNS 290 One of: ENGL 215, ENGL 219, ENGL 222, ENGL 231 Breadth courses Two of: GEOG 201, GEOG 210, POLI 222 or POLI 240, SOCI 202 or SOCI 216 or SOCI 217, GSWS 202 or GSWS 215 or GSWS 216 Science courses Three science courses, including at least one (3-credit) course of Math, Computer Science, or for example: MATHH 111, COSC 122, COSC 180 At least one course (3-credit) lab for example: ASTR 111, BIOL 112, EESC 101 See the Associate of Arts page for a more detailed list of courses that will satisfy the Science Elective Arts courses Three 1st or 2nd year Arts courses from any discipline. A university-level language course is recommended for students who have not completed a Grade 12 high school second language course.	Year One Foundational courses All of: CMNS 100, CMNS 110, **CMNS 120, CMNS 130**, ENGL 100, ENGL 153 Breadth courses Three of: ANTH 121, CMNS 160, GEOG 128 or GEOG 129, HIST 122 or HIST 125, INDG 100, PHIL 114, POLI 101 or POLI 111, SOCI 111, GSWS 100 Year 2 No proposed changes. Science courses Two Science courses in Laboratory Science, Mathematics, Computer Science or Statistics. For a list of possible options, see the Associate of Arts page. Elective Arts courses No proposed changes.

Implementation date: September 2019
Cost: N/A

CMNS 215 – 3 – 4 Public Speaking
New course
Rationale:
This subject-matter fills in an existing gap in the current Communications course offers. A version of the course has been welcome by students as a CMNS 360 - Special Topics. Feedback from students indicated that they would like to see it offered as a stand-alone course from which they would benefit more if taken earlier in their studies. The course is a suitable Arts elective for students from a range of programs who would like to learn conceptual frameworks for Public Speaking, as well as apply these theories to improving their skills.
Calendar description:
This course guides students to furthering their public speaking skills for post-secondary and professional contexts. Students will advance their verbal & written skills (e.g. rhetorical skills, speech structure, research, and slide text editing) and nonverbal communication (e.g. gesture, paralanguage, and images) for developing public presentations. This course includes an added lab for presentation skill practice.
Prerequisites:
3 credits CMNS or 2nd year standing
Course outline:

OKANAGAN COLLEGE
Department of Communications

CMNS 215: Public Speaking

Instructor:
Office: Office hours:
When:
Where: Lecture Theatre, Kelowna campus

COURSE DESCRIPTION
This course guides students to furthering their public speaking skills for post-secondary and professional contexts. Students will advance their verbal & written skills (e.g. rhetorical skills, speech structure, research, and slide text editing) and nonverbal communication (e.g. gesture, paralanguage, and images) for developing public presentations. This course includes an added seminar for presentation skill practice. (2, 0, 2).

OUTCOMES
1. Plan and deliver informative & persuasive speeches.
2. Expand understanding of nonverbal communication in effective public speaking.
3. Evaluate speeches applying the verbal and nonverbal criteria from course readings.
4. Conduct in-depth research – expanding understanding of public speaking skills
5. Apply what you learn to developing an individualized public speaking style.
6. Enact effective listening and constructive feedback skills.
7. Develop strong presentation visual aids.
8. Assess audience and develop speeches that connect through a balance of audience, purpose, & tone.

TEXTS: Crick (2013) Rhetorical Public Speaking & Coursepack of readings – both in the OC bookstore

METHODS
This public speaking course will encourage active student participation by offering opportunities to present, to analyze professional presentations, and to provide meaningful peer-feedback. Each class period will mix teacher-fronted lecture with speaking skill development activities. Students will present weekly, solo or in groups, in spontaneous exercises or planned professional presentations. The additional course **seminar hours** will allow for extended practice time. For example, in the week before each group presentation, group participants will be able to practice during the seminar hour, receiving feedback from peers and instructor. In the two weeks leading up to final presentations, the seminar hour will allow added

instructor consultation, speech revision, and speech practice time. All students are encouraged to work collaboratively in and out of class, supporting their peers' public speaking goals.

EVALUATION

	Assignment	Value
1	Group-led Presentation(Groups of about 4) -organize, discuss, and present one group-lead seminar on 1 course reading	15
2	Preliminary presentation (5 min.) & Self-reflection paper Followed by Informal Presentation from self-reflection	10
3	Analysis of a presentation - applying course readings **OR** Persuasive Speech	10
4	Proposal for final research-based presentation	15
5	Pitch of above topic - (3 minutes on stage)	5
6	Written copy of Final presentation	15
7	Final presentation informed by your research (above)	20
8	Participation: Active participation in discussion and activities & thoughtful listening/responding to presentations	10

ASSIGNMENTS

1. **GROUP-LED PRESENTATION.** (Groups of about 4) Length: Approximately 30 – 40 minutes. Sign up to present on one course article. Your group will conduct one seminar regarding one reading for the course. The seminar will be a formal presentation leading the class to understand and then discuss the main concepts from the reading. **CONTENTS: Summary/Overview** of key concepts; **Example** (illustrate one or more key concepts); **Apply & critically assess** the relevance and application of the authors' research; **Discuss** (engage your audience in the content through question & answer or another means); **Show** (key ideas in crafted slides): After, **reflect** your presentation to assess your presentation strengths and weaknesses

2. **PRELIMINARY PRESENTATION** (5 minutes) and **SELF-REFLECTION PAPER**
This presentation is more spontaneous as a means to capture your style when less-prepared – with the goal of identifying strengths and weaknesses for forming your individual style. Present on a topic of interest (from the topic list developed last class, e.g. pets, food) for 5 minutes. Before presenting, spend about 10 minutes preparing, guided by the three-part basic structure presented in class. Then, in small groups, move to a break out room. Present in turns- while being videoed by one of your group mates (on a phone, most likely). At home, write the Self-Reflection Paper: Watch your presentation. Write a 750-word reflection expanding on three focus delivery points: Pace; Pausing; Hedging; Volume and stress; Directness; Voice tone/quality; Hand Gestures; Content; Eye contact & facial expressions; Stance/ posture; Effective use of space; Nervousness, confidence, forgetfulness; Another point? Provide sufficient detail to illustrate the action. Consider form relative to content and whether the action was meaningful, noted, distracting, etc. Analyze, at times referring to the Morgan (2001) reading if the author's ideas expand or bolster your analysis.

3. **ANALYSIS OF A PRESENTATION.** This assignment will be completed in class. Watch a brief video of a professional presenter, then employ 2-3 course readings to write a 600-750-word analysis essay. Each body paragraph should be driven by a focus point of analysis (e.g. nonverbal communication such as eye contact or paralanguage; order of information; logos/ethos/pathos). A key goal will be to expand understanding of effective verbal and nonverbal communication in public speaking and later apply this learning to crafting a presentation.

   OR

   PERSUASIVE SPEECH . Prepare a 5-minute persuasive speech based on a topic from the list developed in class. Turn in a written copy in advance of giving your speech in-class. We won't use slides, videos, or other digital aides for this speech, but you may use note cards to guide as you present.

4. **PROPOSAL**. Propose a research and final presentation topic that derives from our course readings, lecture, or text. Then, in a 3- page memo, propose your research topic. Contents (1) **Topic** (1-2 paragraphs). (2) **Audience analysis** (2 paragraphs). **Annotated Bibliography** (list 6 credible sources followed by annotations of each). Your research may be a mixture of in-depth peer reviewed and popular sources.

5. **PITCH.** Follow the guidelines presented in class to turn your proposal into an engaging 3-minute pitch that captures the attention and interest of your audience. Spark contemplation and desire for learning. After, pose 2 questions that gather information about your audience's interest and knowledge regarding your topic. Further, as an audience member, provide feedback about presentation style, structure, and connection.

6. **Written copy of RESEARCH-BASED PRESENTATION**. Each presenter will share in-depth knowledge with peers, with the result of expanding the class' public speaking toolbox. Before presenting, gather, synthesize, critique, and discuss credible research to expand your understanding of a topic relevant to public speaking. Then develop this research into an engaging presentation by crafting it in written form. Your goal is to write a 10-minute presentation (which will be about 1500-2000 words, depending on the pace of your presentation). Within your speech copy, add comment bubbles or text in red indicating notes about timing (pausing, rate of speech), body language, audience engagement, props, coresponding slides. (Props and slides are optional).

7. **FINAL PRESENTATION.** Revise your written speech, practice, and then give this final presentation. Based on teacher comments on the written version and class response during practice times, further refine your speech. Refer to the course text and readings to enact skills learned as you practice and revise, readying to present in the final weeks of class. Refer back to your first self-reflection, drawing out the strengths and working out the weaknesses of your presentation style. Craft meaningful visuals to support, but not distract from, the content of your presentation. Give your peers thoughtful feedback in practice sessions.

8. **PARTICIPATION**: Active participation in discussion and activities & thoughtful listening/responding to presentations is essential in this course. As a result, your final participation mark will be based on attendance, preparedness, and full engagement in class exercises and discussion according to the following criteria: **9 – 10 points for participation:** This participation mark is earned by things like…being present and timely and ready to work; engaging effectively in-class exercises; providing informed insight during class discussion and exercises; developing a collegial exchange with classmates; and by missing no more than 1 class period; **6-8 points for participation:** One of previously listed points is lacking and/or missed no more than 3 class periods**. 3-5 points for participation:** This participation mark is earned by a pattern of things like: showing up late, not being prepared, missing key in-class activities, not being fully engaged in in-class exercises and assignments; and/or by missing about 2 weeks of class; **2- 0 points for participation:** This mark is generally the result of missing too many classes, but it is sometimes earned by things like texting during group activities or not being engaged in or ready for discussion. Also a high degree of absence generally negatively affects the student's overall performance on assignments

LATE ASSIGNMENTS

Late written assignments may be considered with a prior notice and discussion between instructor and students. Presentations are another matter since we'll expect to stick to a schedule.

ACADEMIC INTEGRITY POLICY

Students are expected to be aware and follow the Okanagan College Academic Integrity policy. Learn more about the Principles, Scope of the policy, about Academic Integrity Violations, Procedures, and Appeals at:https://webapps-5.okanagan.bc.ca/ok/Calendar/AcademicIntegrity

COLLEGE AND COURSE POLICIES
Every student accepted for registration in this course shall be deemed to have agreed to be bound by the policies, rules, and regulations of Okanagan College. See the OC calendar for further information (http://www.okanagan.bc.ca/calendar/general-academic-regulations-policies/general-academic-regulations-policies.html

Implementation date: January 2020
Cost: N/A

CMNS 370 – 3 – 3 Games in Everyday Life
New course
Rationale:
This is a new 300-level course that current students in the Advanced Certificate in Communication and the Concentration in Communication can benefit from. It also expands the courses offered by the Department of Communications with a view to a new iteration of the Bachelor of Applied Studies as it considers a range of student audiences who could take this course.
Calendar description:
Gamification, games-for-change and serious games are fast-growing trends that bring techniques from the game design process into several areas, including social media, business, education, or culture. This course critically examines the benefits and risks of applying game design techniques to everyday situations. In addition, this course provides students with the frameworks to design a gamified project.
Prerequisites:
Third-year standing and 6 credits Arts
Course outline:

OKANAGAN COLLEGE
Department of Communications
CMNS 370: Games in Everyday Life
Proposed start date Fall 2019

Calendar Description

Gamification, games-for-change and serious games are fast-growing trends that bring techniques from the game design process into several areas, including social media, business, education, or culture. This course critically examines the benefits and risks of applying game design techniques to everyday situations. In addition, this course provides students with the frameworks to design a gamified project. (3,0,0)

Prerequisite: Third year standing and 6 credits Arts

Outcomes: Upon successful completion of this course, students will:

1) Outline benefits and risks of gamification;
2) Critically examine the trends of gamification; games-for-change and serious games;
3) Assess the cultural impact of games on our society;
4) Reflect on experiences that are gamified in their lives;
5) Discuss the potential applications of games in everyday life;
6) Increase their research and professional writing skills;
7) Develop professional documents collaboratively for a project proposal, progress report and final report;
8) Pitch a final report idea and deliver engaging and persuasive presentations on a gamification, games-for-change or serious games project.

Required texts: A custom course pack with readings selected from the following two books and supplemented with a selection of applied readings on gamification.

Ian Bogost, How to do Things with Videogames (University of Minnesota Press, 2011).
Steffen P. Walz & Sebastian Deterding (Editors). The Gameful World: Approaches, Issues, Applications (The MIT Press, 2015)

Method of Instruction: This course does not require that students have had any previous experience with various videogames or games, in general, prior to this course. However, during the course, students are encouraged to come with a playful attitude and expected to allocate time outside class to reflect on their experience of playing games and videogames, as well as carefully observe everyday situations in which games and game techniques are employed.

The course relies on the students' willingness and desire to create a project collaboratively for a real or potential client and share their work with class peers. Policies for choosing a client for the project will be discussed at the start of the course. Under no circumstances, students are to implement the project or make publicly available, in any form and that includes college-wide, any materials resulting from their work in this course, without specific client approval. Detailed criteria for following this process will be presented at the start of the class.

The quality of writing will be essential in the evaluation process, especially as students will produce professional communications documents, open for a client to consider. It naturally follows that editing and proofreading their work will be an important part of their work. Students are strongly encouraged to access all available resources at the college, such as the Learning Centre and complement this course taking with writing courses.

This is a learner-centred course, students share responsibility with the instructor for the success of each class session. Having carefully read and contemplated the texts and topics under consideration in advance of a given class, students should be prepared for vibrant class discussion and online participation. Classes will feature a fluid combination of lectures, presentations, individual and collaborative work, workshops, seminars, and draft review sessions.

Learning Centre

The Learning Centre assists all Okanagan College students with their studies by providing one-to-one and group support beyond regular class time. The goal of the Learning Centre is to help students become effective, independent learners. They can help you with: math - all levels; statistics; essay/research paper writing; organizing ideas & making outlines; grammar, punctuation, vocabulary; reading comprehension; sciences; business and accounting; word processing; spreadsheet/database; study and learning skills; calculator skills. There is no fee for the services, and you can drop in for help (L204), or make an appointment. Go to http://www.okanagan.bc.ca/administration/students/learning-centres/Kelowna.html for more information, or email tlc@okanagan.bc.ca.

Policy on late assignments

All assignments are due on the days marked in the syllabus unless you previously discussed with me an alternative arrangement.

24-Hour Rule

Should you wish to challenge or discuss a mark you have received, you may do so, however, you are advised to not discuss an assignment on the day it was returned or in the classroom. Please come and see me during office hours, or send me an e-mail to set up an appointment. At the time of the meeting, you must exhibit familiarity with the assignment as outlined in the syllabus and discussed in class, and be prepared to state clearly the reasons why your assignment deserves a second evaluation.

College and Course Policies

Every student accepted for registration in this course shall be deemed to have agreed to be bound by the policies, rules, and regulations of Okanagan College. Please visit the following url for more information: http://www.okanagan.bc.ca/calendar/general-academic-regulations-policies/general-academic-regulations-policies.html

Academic Integrity Please check out this important policy here:http://webapps-5.okanagan.bc.ca/ok/Calendar/AcademicIntegrity . The policy explains the academic integrity violations and the procedures we need to follow if they occur.

Course Requirements

All assignments are to be submitted via the *Assignment Dropbox* in Moodle before the start of the class when they are due in order to be formally evaluated. Details will be provided for each assignment in the class notes and/or assignment rubrics closer to the due dates. It is your responsibility to access this information and know when assignments are due. Your grade will be calculated as follows:

Reflective critical essay (individual)	20
Proposal pitch (individual)	5
Proposal (group and individual)	10
Proposal presentation (group)	10
Progress report (group and individual)	10
Progress report presentation (group)	5
Final report (group)	20
Final presentation	10
Attendance & Participation	10
Reflection assignment (optional, bonus points)	5
Total	**100**

Reflective essay (individual) 20

The reflective essay represents your critical engagement with the readings scheduled in the first part of the course. These readings and reflection will prepare you to engage critically with the applied concepts and techniques you will implement with your team in a games-for change/serious games or gamification project, in the second part of the course. You will write a max 1000-word reflective essay on topics of interest to you, raised by the authors of the book and essays discussed in this section. Carefully select a set of topics, discuss their potential and relevance and outline the impact the readings had on you, personally. Consider questions such as:

- What were the excellent points that the authors raised?
- What are the points that could be further elaborated?
- What gaps can you identify in the readings?

More details on the reflective critical essay will be provided closer to the due date. A mandatory draft review session is scheduled in advance of the due date.

Proposal pitch (individual) 5

For this assignment, you will propose a games-for-change/serious games/gamification topic to your potential project team members and to your course instructor. The purpose of the assignment is to persuade your future team to choose your topic and to persuade your instructor that it is suitable for the **final project**.

Proposal (group and individual) 10

With this proposal, you will clear a research plan for one of the topics discussed in your group for a final project. The purpose of the assignment is to persuade your instructor to approve your topic. The proposal shows your team is organised, capable of collecting the required information, and specific and serious about your project plans. It achieves this by the presentation of information supporting an investigation

and analysis of an innovative idea that will lead to reliable results and recommendations. The proposal should also clear up any misunderstandings, questions, or objections to your proposed topic.

Proposal presentation (group) **10**

In a 10-15 min group presentation, please present the key points of your proposal and project plan. Adapt the content of your presentation to the needs of a live audience. Reading parts of your proposal without considering the situation in which you present is not acceptable.

Progress report (group and individual) **10**

For this assignment, you will first submit a brief to your team members which provides a detailed description of the work you have completed so far. After reviewing each team member's work, the group will submit a general progress update, with the individual reports as appendices.

Progress report presentation (group) **5**

In a 10 min group presentation, please present the key points of the group progress report and individual progress reports. Adapt the content of your presentation to the needs of a live audience. Reading parts of your assignment without considering the situation in which you present is not acceptable.

Final report (group) **20**

This is the highlight of your work in this course. The game-for-change, serious games or gamification project will teach you to design a gamified experience, conduct the necessary research to come up with an innovative idea and suggest the means to implement and evaluate its effectiveness for a client. The project can be conducted for a client selected from the students' volunteering opportunities and/or workplace connections or can be theoretical (i.e. developed for an identified, potential client). Students will be graded for completing the report; the implementation is entirely at the discretion of the client. Clear client policies and processes will be detailed at the beginning of the class.

Final report final presentation **10**

This collaborative assignment requires you to prepare and deliver a persuasive and engaging presentation of your final report. Groups should present their report topic in such a way that their findings and recommendations are best expressed to an audience rather than a reader and with a careful consideration of design and visual aids. Groups should ensure that all members of their team speak at some point in the presentation, but all members need not speak for equal lengths of time.

Attendance and participation **10**

Attendance means coming to classes and staying there until the end unless for a reason or another you previously informed me that you are not able to do it on that particular day. At the end of the term I will give you an opportunity to self-evaluate them which I will take into account. Consider the following criteria when you evaluate yourself.

- one class absence — Grade: 4.5
- two class absences — Grade: 4
- three absences — Grade: 3
- four absences — Grade: 2.5
- five absences or more — Grade: 0

Participation means contributing to the discussion, engaging with the material in the readings and in the lectures and interacting with your colleagues. In a nutshell, you will have to make your presence in the class known in a significant way. If you don't like to talk in classes, just have one brilliant idea throughout the semester and I will definitely take that into account. This class is a learning experience. Consider the following criteria when you assign yourself a grade:

- Always on topic, every class Grade: 4.5
- Relevant contribution in most classes Grade: 4
- Contribute a lot but not on topic Grade: 3.5
- Contribute but only when asked Grade: 3
- Engaged but not saying much D Grade: 2.5
- "I don't remember saying anything in this class." Grade: 0

Reflection assignment **Optional 5% bonus**

This assignment is an opportunity to reflect on games-for-change, serious games and gamification and gather more knowledge on this topic from sources available in your community. You can add 5% to your mark if you produce a one-page single spaced, grammatically sound reflective essay on an event held in your community that connects to class topics. Suggestions will be provided in class.

Preliminary course schedule follows.

Block 1 - Games in Everyday Life: Approaches & Issues

Week 1 - Introductions; overview of class requirements and syllabus
Topics: What is gamification?; What does it mean that we live in a ludic culture?
Readings: Bogost (Introduction: Media Microecology)
Walz & Deterding (Introduction, Approaches & response "Manifesto")

Week 2 - History and discourses of the gameful world
Topics: games, situated meaning, semiotic domains; Huizinga's "magic circle" and "homo ludens"; entertainment vs. serious games; gamification, benefits and risks
Readings: Bogost (At least 5 chapters from 1-10 required; all recommended)
Walz & Deterding (1, 2)

Week 3 - Games, rhetoric & culture
Topics: procedural rhetoric; player identities; cultural impact of games and gamification
Readings: Bogost (At least 5 chapters from 11-Conclusions required; all recommended)
Walz & Deterding (11, 12)
Discussion of critical essay

Week 4 - Games, society & economy
Topics: games and neo-liberalism; games, ideas, ideology; game theory
Readings: Walz & Deterding (5 & response "Losing is Fun", 8 & response "Games and the World", 10 & response "Monkey Brains and Fraction Bingo: In Defence of Fun",)
Discussion of proposal pitches

Week 5 - Ethics & privacy in a gamified world
Topics: games and agency; online communities; ethics; privacy; data collection in games
Readings: Walz & Deterding (13, 14, 15 & response "Playful systems")
Final critical reflective essay - draft review session
Discussion of group proposal

Week 6 - Proposal pitches; Reflective critical essay due before the start of the class.

Block 2: Applications of Gamification Design

Week 7 - Gamification, behavior, motivation
Topics: theories of human motivation, development and wellness; performance; needs; creating recognition, immersion and engagement
Readings: Walz & Deterding (3 & response "Contraludics", 4)
Christopher Swan - "Gamification: A new way to shape behavior" (2012)

Group and individual proposal draft review session

Week 8 - Breaking down playfulness: games as a series of design & aesthetic choices

Topics: design workflows; design thinking; dissecting playfulness; basics of game design (i.e. rules, narrative, theme, goals, players)

Readings: Walz & Deterding (6 & response "Games as Design Archetypes", 7 & response "A Gameful Mind", Prelude "Gamepocalypse and the Pleasure Revolution" & 17)
Andrzej Marczewski - "Game Thinking - Breaking down gamification and games" (2013)
Group proposal presentations
Discussion of progress reports

Week 9 - Gamification, social media & the enterprise

Topics: apps revolution; gamification and marketing; uses in internal communications and working with teams; gamified communication campaigns

Readings: Walz & Deterding (18 & response "When Peers Select Tasks and Teams", 19 & response "Collaboration in the Gameful World")
Nir Eyal and Stuart Luman - "The Pros and Cons of a Gamified Work Culture" (2014)
Shorty Awards – Best Use of Gamification examples (2018)
Yu-Kai Chou - "A comprehensive List of 90+ Gamification Cases with ROI Stats" (2013)
Group and individual progress report draft review session

Week 10 - Gamification: Steps and Toolkit

Topics: basic steps and elements of a gamification design project

Readings: Selection TBD from Werbach & Hunter. The Gamification Toolkit (2015)
Andrzej Marczewski - "6 User Types of Gamification Design" (2014)
Yu-Kai Chou - "Octalysis: Complete Gamification Framework" (2014)
Progress report presentations.
Discussion of final report

Week 11 - Applications of gamification

Topics: student-led discussion of successful gamified projects

Readings: Select three chapters from Walz & Deterding (20, 21, 22, 23, 24 or 25) based on your interests

Week 12 - Epic wins & fun fails

Topics: social support and connectivity; benefits of playing, winning and losing; games for social good; technical conditions for a gameful world

Reading: Jane McGonigal - Reality is Broken: Why Games Make us Better and How They Can Change the World (chapter 4 - "Fun Failure and Better Odds of Success" and chapter 12 - "Missions Impossible")
Walz & Deterding (16, "Bot mediated reality", 25, "I'm Not Playful, I'm Gameful")
Final report project draft review session

Week 13 - Final report final presentations
Week 14 - Final presentations, final evaluations of participation grade
Final report project due post-presentations (deadline TBD)

Implementation date: September 2019
Cost: N/A

Science, Technology, and Health Programs

ENGR 101 – 3 – 4 Engineering Design I
New course
Rationale:
The course is one of the courses for the Common First Year Engineering Curriculum (CFYEC). This course is currently not offered at Okanagan College.
Calendar description:
This course provides an introduction to the principles of engineering design, engineering drawing and sustainable practice. This knowledge will be applied to practical projects to be undertaken by teams of students.
Prerequisites:
Admission into the Common First Year Engineering Curriculum.
Course outline:

Course Overview

In ENGR 101, you will get an introduction *to drafting* by *doing* drafting. Through a mix of hand and computer aided drafting projects and case studies, you will wrestle with issues of scale, dimensioning, etc. and learn how to solve these issues. You will also have to work in teams (as in the real world) to complete a project. In doing so, you will develop a toolbox of skills that all engineers are expected to possess: the ability to draw a drawing to the appropriately scale that effectively gets the point across, the ability to work effectively in teams, to communicate effectively, to generate and convey ideas using best practices,

Calendar Description:

This course provides an introduction to the principles of engineering design, engineering drawing and sustainable practice. This knowledge will be applied to practical projects to be undertaken by teams of students.

Major Topics:

1. **Introduction**
   Definition of terms

2. **Geometric construction**
   The process of drawing using lines, circles and other shapes.

3. **Two (2)-dimensional Drawings**
   Drawing objects (house plans, mechanical parts, etc).

4. **Scales**

Measuring and determining lengths of elements or objects

5. **Sections**
   Determining sections of objects shown in plan.

6. **Orthographic projection**
   "Perspective views", Object faces and sides.

7. **Text**
   Using text to convey information about an element and object.

8. **Dimensioning**
   Using dimensions to show the lengths of elements and objects.

9. **Team Project**
   Using all of the above topics, complete a team project for a proposed residential house.

Lab Topics

Lab. No.

0 File Management, introduce sustainability

1 Standard border, simple lines, circles, squares, etc. in two dimensions

2 Scales – by hand and in ACAD

3 Sections

4 Field trip to a residential house under construction

5 Orthographic Projections, sides, plan and elevation views

6 Inserting text in Sections and drawings in two dimensions

7 Team Project (3 weeks) – Draw a residential house in plan and elevation views

Course Evaluation

The Course Evaluation will be based on the following break-down:

Professionalism	5%
Labs/Assignments	25%
Quizes	10%
Mid Term exam	25%
Final exam	35%

The mark for Professionalism is based on how you conduct yourself as well as your attitude towards the class. Please see the attached sheet on Overview of Professionalism mark.

Course Materials:

- No text required. See on line tutorials for ACAD assistance.
- Custom course material for ENGR 101

- Metric Scale: (1:1, 1:10. 1:2, 1:20. 1:5, 1:50).
  There is a standard Metric scale with all these values (type S1).
- Architects Scale: [(1”, ½”) (1/4”,1/8”)] [(3/4”,3/8)(1½”, 3”)] [3/16”,3/32”)(16)]

This equipment is mandatory and required for this and other courses.

Learning Outcomes:

After completion of this course the student will be able to:

1. Complete sketching
2. In ACAD, complete isometric/multi-dimensional drawing
3. Understand Lines/angles/dimensioning
4. Identify uses of ACAD in the Civil Engineering community
5. Understand group dynamics theory (e.g. Tuckman model)
6. Incorporate Models for building successful teams
7. Develop Conflict resolution skills in a team environment
8. Give and receive feedback in a professional manner
9. Organize and complete a lab report
10. Have a basic knowledge of sustainability

Occupational Health and Safety

Since this course has practical labs, there is a potential to be hurt. Please see the Lab Safety sheet for all labs for the general safety rules for these labs. Any safety issues specific for a lab will be reviewed prior to that lab.

COMMON FIRST YEAR ENGINEERING DEPARTMENT POLICIES

Standard Calculator

Casio fx991ES (Plus C). This will be the only calculator allowed for all midterm and final tests.

Common First Year Engineering Department Passing Grade Requirements Policy

To obtain a passing grade in this course it is necessary to obtain a combined midterm and final exams average of at least 50%.

Common First Year Engineering Department Laboratory Attendance Policy

Attendance of each lab period is mandatory. If a student misses a lab period due to illness, a doctor's note must be provided. In that case, that lab will not count for or against you.

Any student **missing two or more labs,** regardless of the reason(s) will be awarded a maximum final mark of **48%; you will fail the course overall. Laboratory attendance will be recorded.**

Common First Year Engineering Department Late Policy

Assignments or labs received after the due date will receive a late penalty applied to the maximum mark available. Missing or incomplete submissions may not be accepted. Late penalties are as follows (note: a day is considered 24 hours):

1 day 10%
2 days30%
3 days60%
4 days 100%

Common First Year Engineering Department Collection of Student Work Policy

This is a requirement of the accreditation process. Samples of student work will be collected during the term. At the end of the semester, each professor is responsible for collecting a complete copy of the best student's work. This will include class notes, assignments, labs, exams etc. This copy will be archived.

Overview of Professionalism Mark

Class Professionalism: 5

marks

Your professionalism mark is based on how you conduct yourself as well as your attitude towards the class. To facilitate active professionalism by everyone, it is important that class members have a shared vision of what is and is not professionalism.

Professionalism can be and is:

1. a positive attitude towards the class
2. coming to class prepared to learn (reading ahead, etc.)
3. asking key questions that lead to revealing discussions
4. providing summaries
5. making observations that integrate concepts and discussions 6. engaging in devil's advocacy
7. disagreeing with the instructor when the difference of opinion serves as both a counterpoint and a way of exploring all sides of a concept, issue or practice
8. being an active participant in group discussions
9. working with others to come to a common understanding of the topics - in and out of the classroom
10. pulling your own weight on group projects and participating enthusiastically in classroom and lab group activities.
11. citing relevant personal examples

By extension, contribution is not continuously dominating class and group discussions. It also means listening to what others say - they have an equal right to contribute. Contribution is not coming to class unprepared and ill equipped to intelligently discuss the topic of the day. Having a positive attitude is not forced but should come naturally or you should be continuously working on it. Contribution is not being a warm body in the classroom whose mind is pre-occupied with other critical issues such as: how to tackle the next math assignment, what party to go to on Saturday, etc., etc.

Marks for Professionalism will be allocated in the following manner:

0	for failing on all of the previously identified ways of contributing to the classroom experience. This may also include having a negative attitude.
2.5	for attending class on a regular basis and only occasionally contributing to the classroom experience.
3	for showing an active interest in class activities and participating in classroom discussions; for regularly making insightful comments which help others to understand the course material; for being a positive group member.
3-4	for consistently enhancing the quality of class discussion and the labs (creativity will be rewarded).

4-5	Students in this category provide leadership in the classroom and the lab. They work towards enhancing the interpersonal dynamics of the classroom and the lab. This does not mean they dominate the setting; rather they act as facilitators, bringing others into the discussion and encouraging a positive attitude.

Note: These participation marks are scaled so that what you might consider 'average" participation, results in a mark of about D or C-. Do not let this surprise you at the end of the term!

Implementation date: September 2019
Cost: N/A

ENGR 111 – 3 – 4 Engineering Design II
New course
Rationale:
The course is one of the courses for the Common First Year Engineering Curriculum (CFYEC). This course is currently not offered at Okanagan College. It is a continuation for ENGR 101.
Calendar description:
This course introduces the principles of engineering design, engineering drawing and sustainable practice. This knowledge will be applied to practical projects to be undertaken by teams of students. The engineering profession, and engineer's role in society will also be introduced.
Prerequisites:
ENGR 101
Course outline:

Course Overview:

ENGR 111 is a continuation of ENGR 101. It builds on the concepts you have already seen, further developing your proficiency in drafting, sustainability, professionalism, communication, teamwork, and more. In addition, you will continue to expand your engineering toolbox with new skills in working with hand tools, design considerations, engineering drawings, 3D printers and perspectives in sustainability, and challenging problems in design and decision making. You will also review project risks and professional ethics.

Calendar Description:

This course introduces the principles of engineering design, engineering drawing and sustainable practice. This knowledge will be applied to practical projects to be undertaken by teams of students. The engineering profession, and engineer's role in society will also be introduced.

Major Topics:

1. **The Design Process**
   Describe and implement
   How to incorporate sustainability

2. **Identify and engage Stakeholders**

3. **Project scope**
   Overview and detailed

4. **Design considerations**
   Local materials, construction techniques, etc.

5. **The Risks and hazards of the Construction process**

Introducing the risks and hazards, both detailed and overview.

6. **Brainstorming**
   Green and red light processes

7. **Decision Matrix**
   The decision process

8. **The Engineers role in Society**
   The perception of Engineers by society, the role of Engineers, Ethics, etc.

9. **Team Project**
   Build and test prototypes with a 3D printer in a team environment.

Lab Topics

Lab. No. and Topics

1 The Design and life cycle process

2 Stakeholders

3 Project Scope, work packages

4 The Construction process – Risks and hazards

5 Field trip to a residential subdivision under construction

6 Brainstorming

7 The decision matrix

8 Field trip to a consulting firm

9 Team Project (2 weeks) – Use a 3D printer

Course Evaluation

The Course Evaluation will be based on the following break-down:

Professionalism	5%
Labs/Assignments	20%
Quizes	10%
Mid Term exam	20%
Final exam	35%

The mark for Professionalism is based on how you conduct yourself as well as your attitude towards the class. Please see the attached sheet on Overview of Professionalism mark.

Course Materials (Mandatory):

- Introduction to Professional Engineering in Canada, Fifth Edition or Higher, by Gordan C. Andrews et.al.

- Custom Course Material for ENGR 111
- Metric Scale: (1:1, 1:10. 1:2, 1:20. 1:5, 1:50).
  There is a standard Metric scale with all these values (type S1).
- Architects Scale: [(1", ½") (1/4",1/8")] [(3/4",3/8)(1½", 3")] [3/16",3/32")(16)]

Learning Outcomes:

After completion of this course the student will be able to:

1. Describe/identify tools within each design process step
2. Identify and how to engage stakeholders
3. Identify project scope
4. Integrate design considerations including environment, stakeholder input, safety, etc.
5. Understand traditional vs. Sustainable Design Criteria
6. Identify risks and hazards at a typical construction site
7. Understand group dynamics theory (e.g. Tuckman model)
8. Develop Conflict resolution skills in a team environment
9. Utilize brainstorming techniques and decision processes
10. Organize and complete a lab report
11. Understand life cycle assessment
12. Understand the integration of ACAD and 3D printers

Occupational Health and Safety

Since this course has practical labs, there is a potential to be hurt. Please see the Lab Safety sheet for all labs for the general safety rules for these labs. Any safety issues specific for a lab will be reviewed prior to that lab.

COMMON FIRST YEAR ENGINEERING DEPARTMENT POLICIES

Standard Calculator

Casio fx991ES (Plus C). This will be the only calculator allowed for all midterm and final tests.

Common First Year Engineering Department Passing Grade Requirements Policy

To obtain a passing grade in this course it is necessary to obtain a combined midterm and final exams average of at least 50%.

Common First Year Engineering Department Laboratory Attendance Policy

Attendance of each lab period is mandatory. If a student misses a lab period due to illness, a doctor's note must be provided. In that case, that lab will not count for or against you. Any student **missing two or more labs,** regardless of the reason(s) will be awarded a maximum final mark of **48%; you will fail the course overall. Laboratory attendance will be recorded.**

Common First Year Engineering Department Late Policy

Assignments or labs received after the due date will receive a late penalty applied to the maximum mark available. Missing or incomplete submissions may not be accepted. Late penalties are as follows (note: a day is considered 24 hours):

1 day 10%
2 days 30%
3 days 60%
4 days 100%

Common First Year Engineering Department Collection of Student Work Policy

This is a requirement of the accreditation process. Samples of student work will be collected during the term. At the end of the semester, each professor is responsible for collecting a complete copy of the best student's work. This will include class notes, assignments, labs, exams etc. This copy will be archived.

Overview of Professionalism Mark

Class Professionalism: 5 marks

Your professionalism mark is based on how you conduct yourself as well as your attitude towards the class. To facilitate active professionalism by everyone, it is important that class members have a shared vision of what is and is not professionalism.

Professionalism can be and is:

1. a positive attitude towards the class
2. coming to class prepared to learn (reading ahead, etc.)
3. asking key questions that lead to revealing discussions
4. providing summaries
5. making observations that integrate concepts and discussions 6. engaging in devil's advocacy
7. disagreeing with the instructor when the difference of opinion serves as both a counterpoint and a way of exploring all sides of a concept, issue or practice
8. being an active participant in group discussions
9. working with others to come to a common understanding of the topics - in and out of the classroom
10. pulling your own weight on group projects and participating enthusiastically in classroom and lab group activities.
11. citing relevant personal examples

By extension, contribution is not continuously dominating class and group discussions. It also means listening to what others say - they have an equal right to contribute. Contribution is not coming to class unprepared and ill equipped to intelligently discuss the topic of the day. Having a positive attitude is not forced but should come naturally or you should be continuously working on it. Contribution is not being a warm body in the classroom whose mind is pre-occupied with other critical issues such as: how to tackle the next math assignment, what party to go to on Saturday, etc., etc.

Marks for Professionalism will be allocated in the following manner:

0	for failing on all of the previously identified ways of contributing to the classroom experience. This may also include having a negative attitude.
2.5	for attending class on a regular basis and only occasionally contributing to the classroom experience.
3	for showing an active interest in class activities and participating in classroom discussions; for regularly making insightful comments which help others to understand the course material; for being a positive group member.
3-4	for consistently enhancing the quality of class discussion and the labs (creativity will be rewarded).
4-5	Students in this category provide leadership in the classroom and the lab. They work towards enhancing the interpersonal dynamics of the classroom and the lab. This

does not mean they dominate the setting; rather they act as facilitators, bringing others into the discussion and encouraging a positive attitude.

Note: These participation marks are scaled so that what you might consider 'average" participation, results in a mark of about D or C-. Do not let this surprise you at the end of the term!

Implementation date: September 2019
Cost: N/A

PHYS 215 – 3 – 3 Thermodynamics
Course revision:

- **Prerequisites**

Rationale:
Updating pre-reqs such that Civil Engineering Bridge students can take the course. PHYS215 is a required course for the Civil Engineering Bridge to UBCO. Currently the pre-requisite only covers Electrical Engineering Bridge students, as this was the first Bridge program to be established. Any Technology Bridge student should be allowed to take PHYS215.
Prerequisites:

Existing	Proposed
PHYS 121 or PHYS 112[1] and PHYS 122[1] or admission to the OC Electronic Engineering Technology Bridge to UBCO Electrical Engineering [1] minimum grade of 68 required	PHYS 121 or PHYS 112[1] and PHYS 122[1] or admission to an OC Engineering Technology Bridge to UBC Okanagan. [1] minimum grade of 68 required

Implementation date: September 2019
Cost: N/A

PHYS 126 – 3 – 6 Physics for Electronics Engineering Technology
New course
Rationale:
This course is part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal Fall and Winter academic semesters. The current physics course for electronics has a scope that is too wide and covers topics that are irrelevant to electronics. It also does not have enough lab time to properly provide labs for all the topics. In this new course, learners will focus on physics that is most relevant to electronics which includes a heavy focus on labs.
Calendar description:
This course is an introduction to Newtonian mechanics, kinematics, conservation of energy, simple harmonic motion, electrostatics, magnetism, and electromagnetic radiation. Topics will be discussed with special reference to applications in the field of electronics. Laboratory experiments will be completed to expand on the topics covered in the course work.
Prerequisites:
Acceptance to ELEN program
Corequisites:
MATH 137
Course outline:

PHYS 126 – Physics for Electronics Engineering Technology

Credit Hours:
3.0
Presentation Format:
Lecture: 3.0 hrs/wk Lab 3.0 hrs/wk Seminar 0.0 hrs/wk
Prerequisites:
Admission to Electronics Engineering Technology program

Corequisites:
Math 137

Description:
This course is an introduction to Newtonian mechanics, kinematics, conservation of energy, simple harmonic motion, electrostatics, magnetism, and electromagnetic radiation. Topics will be discussed with special reference to applications in the field of electronics. Laboratory experiments will be completed to expand on the topics covered in the course work.

Evaluation:
Labs: 20%
Midterms : 25%
Final Exam: 40%
Assignments: 15%

Major Topics:
1.0: Newtonian Mechanics
2.0: Energy
3.0: Simple Harmonic Motion
4.0: Electrostatics
5.0: Magnetism
6.0: Electromagnetic Waves

Learning Outcomes:
1. Describe the motion of objects in one and two dimensions using graphs of displacement, velocity and acceleration.
2. Solve quantitative problems involving constant acceleration motion in one and two dimensions.
3. Describe Newton's 1st, 2nd and 3rd laws as they relate to linear systems; use Newton's laws to solve problems involving gravitational, normal, friction, electric, and magnetic forces.
4. Use the work-energy theorem and conservation of energy to solve linear and rotational mechanics problems.
5. Be able to relate circular motion to simple harmonic motion and solve problems involving simple harmonic motion; analyze algebraic and graphical representations of simple harmonic motion.
6. Describe the physical properties of charge. Use Coulomb's law and Gauss's law to solve problems involving electric fields, forces, and potentials of various charge distributions.
7. Describe the physical properties of charge. Use Coulomb's law and Gauss's law to solve problems involving electric fields, forces, and potentials of various charge distributions.
8. Discuss how magnetism arises and be able to calculate magnetic field strengths and configurations from electromagnetic principles including Ampere's law.
9. Use Faraday's law to determine induced voltages. Be able to describe physically how a motor and generator use electromagnetic interactions.
10. Describe how Maxwell's laws predict the existence of electromagnetic radiation; show how accelerating charges produce electromagnetic waves.
11. Collect, interpret, and present results from experiments performed to investigate physical laws

Implementation date: September 2019
Cost: N/A

ELEN 110 – 3 – 6 Computer Fluency
New course
Rationale:
This course is part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal Fall and Winter academic semesters. The content is being expanded to address industry needs as directed by the PAC.
Calendar description:
This course is an introduction to computer skills. Topics include operating systems, electronic communication, websites, networking, document creation and editing, web programming, data analysis using spreadsheets/databases and collaboration tools and concepts (information representation, abstraction, algorithmic thinking, processing and summarization). Learners will develop life-long productivity and understanding of engineering tools for technologists. Skills, theory and techniques will be re-enforced through lab work.
Prerequisites:
Admission to the ELEN program
Course outline:

ELEN 110 - Computer Fluency

Credit Hours:
3.0
Presentation Format:
Lecture: 3.0 hrs/wk Lab 3.0 hrs/wk Seminar 0.0 hrs/wk
Prerequistes:
Admission to the ELEN program.
Corequistes:
Description:
This course in an introduction to computer skills. Topics include operating systems, electronic communication, websites, networking, document creation and editing, web programming, data analysis using spreadsheets/databases and collaboration tools and concepts (information representation, abstraction, algorithmic thinking, processing and summarization). Learners will develop life-long productivity and understanding of engineering tools for technologists. Skills, theory and techniques will be re-enforced through lab work.
Evaluation:
Labs: 15%
Final Exam : 40%
Assignments and Quizzes: 15%
Midterm (2 x15): 30%

Major Topics:
1.0: Computer Systems and Terminology
2.0: Computer Internals
3.0: Operating Systems
4.0: Networking and the Internet
5.0: Algorithmic Thinking and Problem Decomposition
6.0: Web Development with HTML/CSS
7.0: Presentation Tools
8.0: Information and Data Representation
9.0: Spreadsheets
10.0: Social Implications of Technology
11.0: Limits of Computation
12.0: Productivity Tools (Version control/Team communications tools), Information Processing and Summarization

Learning Outcomes:
1.0: Explain engineering problem solving techniques and methodologies, such as brainstorming and reverse-engineering

2.0: Apply Excel functionality to write formulas, draw charts, use functions, macros and apply formatting
3.0: Develop and format documents with word-processing tools
4.0: Recognize key computer terminology, organization and data representation techniques
5.0: Identify key parts of computer architectures
6.0: Design and deliver effective presentations with presentation formatting tools
7.0: Investigate the structure of a computer network, how networks function and how they are addressed
8.0: Create a simple webpage utilizing HTML
9.0: Summarize and compare the social applications of computer in society and in the role of a technologist
10.0: Investigate the role of the operating system and develop skills for basic configuration and file sharing
11.0: Examine productivity tools and assess how tools can be used by technologists

ELEN DEPARTMENT POLICIES

ELEN Department Passing Grade Requirements Policy

Students must obtain a passing grade (at least 50%) in both the lecture component and the laboratory/practical component of the course. **If the student receives a failing grade (less than 50%) in either the lab or lecture component, the final mark for the whole course will be no more than 50%. Note: Students must obtain an overall 60% GGA (Graduating Grade Average) to be awarded a Diploma in Electronic Engineering Technology.**

ELEN Department Laboratory Attendance Policy

Attendance of each lab period is mandatory. If a student misses a lab period due to illness, a doctor's note must be provided. In that case, that lab will not count for or against the student. Any student **missing three or more labs**, regardless of the reason(s) will be awarded a maximum final mark of **49\%; you will fail the course overall. Laboratory attendance will be recorded.**

ELEN Department Collection of Student Work Policy

This is a requirement of the accreditation process. At the end of the semester, each professor is responsible for collecting a representative sample of student's work from the term. This may include any work completed during the term such as assignments, labs, or exams. This copy will be redacted and archived.

Implementation date: September 2019
Cost: N/A

ELEN 152 – 3 – 30 Fabrication II
New course
Rationale:
This course is part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal Fall and Winter academic semesters. The course is a follow-up to ELEN142 course Fabrication I.
Calendar description:
In this course, learners will perform the soldering, assembly and wiring of an electronic board. Topics include high reliability soldering techniques, IPC soldering standards, thermal management, component selection, board assembly, board testing, wiring harness construction, prototype development, packaging, sheet metal work and fastener selection. Proper use of tools and safe working practices are emphasized. Learners will assemble and build an electronic project designed in Fabrication I.
Prerequisites:
ELEN 142
Course outline:

ELEN 152 - Fabrication II

Credit Hours:
3.0
Presentation Format:
Lecture: 10.0 hrs/wk Lab 20.0 hrs/wk Seminar 0.0 hrs/wk
Prerequistes:
ELEN 142: Fabrication I
Corequistes:
Description:
In this course, learners will examine the soldering, assembly and wiring of an electronic board. Topics include high reliability soldering techniques, IPC soldering standards, thermal management, component selection, board assembly, board testing, wiring harness construction, prototype development, packaging, sheet metal work and fastener selection. Proper use of tools and safe working practices are emphasized. Learners will assemble and build an electronic project designed in Fabrication I.
Evaluation:
Labs: 20%
Test: 20%
Project: 40%
Lab Test: 20%

Major Topics:
1.0: IPC standards
2.0: Soldering Techniques using IPC standards
3.0: Project Assembly
4.0: Basic Low Voltage Cabling/Wiring
5.0: Thermal Management
6.0: Circuit Design Calculations
7.0: Sheet Metal Work
8.0: Fasteners and hardware
9.0: Shop skills and practices
10.0: Voltage/Current Regulators
11.0: Batteries
12.0: Component Selection
13.0: Lab Safety

Learning Outcomes:
1.0: Apply IPC Soldering Standards
2.0: Utilize Thermal Management Procedures
3.0: Perform Circuit Design Calculation
4.0: Apply Basic Cabling/Wiring knowledge
5.0: Identify the various hand tools commonly used by a technologist
6.0: Identify the power tools used to fabricate a chassis
7.0: Understand shop/tool safety
8.0: Design Required Voltage/Current Regulators
9.0: Select batteries
10.0: Identify and select basic electronic components, resistors, capacitors, inductors, diodes and transistors

Implementation date: September 2019
Cost: N/A

ELEN 153 – 3 – 5.5 Fundamentals of the Internet of Things
New course
Rationale:
This course is part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal Fall and Winter academic semesters. This course is being updated and refocused to address industry needs as directed by the PAC.

Calendar description:
This course is an introduction to fundamental concepts and technologies used in the Internet of Things (IoT). Topics include limitations, applications and deployment of IoT systems, edge device architectures, protocols and applications, sensor basics and data gathering, gateways, storage and visualization. Learners will explore the involved interconnection of IoT concepts from network edge through data storage and analysis. IoT data transport protocols, data storage solutions and visualization techniques will be introduced. Learners will compare and utilize existing enterprise IoT solutions as potential platforms in addition to understanding and designing edge devices. Emphasis is placed on building and utilizing an edge to storage solution, enabling data collection. Learning will be re-enforced through practical application with lab work.
Prerequisites:
ELEN 110
Corequisites:
ELEN 116
Course outline:

ELEN 153 - Fundamentals of the Internet of Things
Credit Hours:
3.0
Presentation Format:
Lecture: 3.0 hrs/wk Lab 2.5 hrs/wk Seminar 0.0 hrs/wk
Prerequistes:
ELEN 110: Computer Fluency
Corequistes:
ELEN 116: Programming and Interfacing
Description:
This course is an introduction to fundamental concepts and technologies used in the Internet of Things (IoT). Topics include limitations, applications and deployment of IoT systems, edge device architectures, protocols and applications, sensor basics and data gathering, gateways, storage and visualization. Learners will explore the involved interconnection of IoT concepts from network edge through data storage and analysis. IoT data transport protocols, data storage solutions and visualization techniques will be introduced. Learners will compare and utilize existing enterprise IoT solutions as potential platforms in addition to understanding and designing edge devices. Emphasis is placed on building and utilizing an edge to storage solution, enabling data collection. Learning will be re-enforced through practical application with lab work.

Evaluation:
Final Exam : 40%
Labs : 15%
Midterm (2x15): 30%
Assignments and Quizzes: 15%

Major Topics:
1.0: Applications of IoT
2.0: Open problems with IoT Systems
3.0: Protocols - Features and Characteristics
4.0: Sensor Basics and Data Gathering
5.0: Data Management
6.0: Gateways, Storage and Visualization
7.0: Challenges and Limitations in IoT Systems
8.0: Integrating Devices into a Sensor Field

Learning Outcomes:
1.0: Determine and assess common network topologies and configurations for IoT Systems
2.0: Select and specify data communications equipment for edge devices and connection brokers
3.0: Utilize and maintain data communications network software applications for the management and visualization of data and network devices
4.0: Calculate, model and measure power requirements and energy availability for edge devices

5.0: Characterize device performance utilizing lab equipment
6.0: Apply a variety of data communications protocols linking controllers with field devices and industrial data management systems
7.0: Understand and model data transfer costs and sampling rates based on power budgets
8.0: Examine data communications media including cables, couplers, terminations, support structures, enclosures, and junction boxes
9.0: Select and specify data communications equipment including communications gateways, switches, and routers
10.0: Identify, and characterize the current landscape and applications of IoT systems
11.0: Assess and plan for device deployment into a sensor field

Implementation date: September 2019
Cost: N/A

ELEN 213 – 3 – 5 Engineering Project Management
New course
Rationale:
This course is part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal Fall and Winter academic semesters. The PAC has indicated the need for increased project management knowledge. The course will also allow students to start working on the design of their final project as time is being lost in term 4 due to the reduction of the extended semester.
Calendar description:
This course examines and utilizes tools and techniques to complete projects successfully under project constraints. Topics include project lifecycle, stakeholder analysis, scope and charter development, requirements gathering, ethical considerations and professional standards, project planning and initialization, resource planning, budgeting, quality planning, communications, procurements, Program Evaluation and Review Technique (PERT), Critical Path Methods (CPM), and project management software. Learners will utilize project management techniques to analyze and develop project requirements, develop a timeline and budget for an electronic design project. Skills, theory and techniques will be re-enforced through lab work.
Prerequisites:
ELEN 110, CMNS 133
Course outline:

ELEN 213 - Engineering Project Management

Credit Hours:
3.0
Presentation Format:
Lecture: 3.0 hrs/wk Lab 2.0 hrs/wk Seminar 0.0 hrs/wk
Prerequistes:
ELEN 110: Computer Fluency
CMNS 133: Technical Writing and Communications I
Corequistes:
Description:
This course examines and utilizes tools and techniques to complete projects successfully under project constraints. Topics include project lifecycle, stakeholder analysis, scope and charter development, requirements gathering, ethical considerations and professional standards, project planning and initialization, resource planning, budgeting, quality planning, communications, procurements, Program Evaluation and Review Technique (PERT), Critical Path Methods (CPM), and project management software. Learners will utilize project management techniques to analyze and develop project requirements, develop a timeline and budget for an electronic design project. Skills, theory and techniques will be re-enforced through lab work.

Evaluation:
Labs: 15%
Project Proposal: 20%

Assignments and Quizzes: 15%
Final : 30%
Midterm: 20%

Major Topics:
1.0: Project Management: Past and Present. Introduction to Project Management Terminology
2.0: Project Management Overview Project Life-Cycle
3.0: Frameworks for Project Management Stakeholder Management
4.0: Culture and Project Management Project Initiation
5.0: Overview of Project Planning and Scope Planning
6.0: Project Schedule Planning with GANTT, PERT and CPM
7.0: Resource Planning
8.0: Budget Planning
9.0: Procurement Management
10.0: Quality Planning
12.0: Communications Planning
13.0: Risk Management Planning
14.0: Closing Out a Project
15.0: Developing the Project Documentation for an Electronic Design Project

Learning Outcomes:
1.0: Ability to utilize industry standard management practices to interact with project teams and project management
2.0: Utilize software to plan and map out project progress
3.0: Develop, plan and management key components of a project
4.0: Analyze project success and failure modalities via case studies
5.0: Define project management as a discipline and its related terminology
6.0: Illustrate the importance of scope definition to project planning
7.0: Define project management and compare common project frameworks and standards
8.0: Evaluate project timelines via PERT and CPM
9.0: Describe and apply stakeholder analysis and management
10.0: Explain the importance of scope definition to project planning
11.0: Demonstrate use of project planning processes by developing core project plans including schedules, budgets, risk matrices and communication plans
12.0: Demonstrate use of project managing processes especially change control
13.0: Examine factors that contribute to project success and failure
14.0: Assess impact of team leadership on success of projects
15.0: Utilize tools to develop and analyze project work breakdown structure
16.0: Develop a project charter, scope document, requirements, timeline and budget for an electronic design project utilizing the IEEE citation format

Implementation date: September 2019
Cost: N/A

ELEN 240 – 3 – 6 Fundamentals of Communication Systems
New course
Rationale:
This course is part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal Fall and Winter academic semesters. This particular course currently has an extended semester, so in order to fit it in to a regular semester, some of the content needs to be removed. It is also being moved to term 3 to allow for improved prerequisite coverage.
Calendar description:
This course is an introduction to the fundamentals of communication systems with a focus on analog transmissions. Topics include the EM spectrum, communications channel, sources of noise, passive filters and resonant systems, AM, FM, SSB, DSB, and RF transmitters and receivers. Learners will gain a

fundamental understanding of communications principles, utilizing mathematics to design, characterize and assess different aspects of communication systems. Skills, theory, and techniques will be re-enforced through lab work.

Prerequisites:

ELEN 140, ELEN 146

Course outline:

ELEN 240 - Fundamentals of Communication Systems

Credit Hours:

3.0

Presentation Format:

Lecture: 3.0 hrs/wk Lab 3.0 hrs/wk Seminar 0.0 hrs/wk

Prerequistes:

ELEN 140: Electrical Circuit Analysis II
ELEN 146: Electronic Devices and Circuits I

Corequistes:

Description:

This course is an introduction to the fundamentals of communication systems with a focus on analog transmissions. Topics include the EM spectrum, communications channel, sources of noise, passive filters and resonant systems, AM, FM, SSB, DSB, and RF transmitters and receivers. Learners will gain a fundamental understanding of communications principles, utilizing mathematics to design, characterize and assess different aspects of communication systems. Skills, theory, and techniques will be re-enforced through lab work.

Evaluation:

Labs: 15%
Midterms (2 x 15): 30%
Final Exam : 40%
Assignments and Quizzes: 15%

Major Topics:

1.0: Introduction to Communications
2.0: Signals, Gain and Noise
3.0: Fourier Analysis of Signals
4.0: Application of Passive Filters and Tuned Circuits
5.0: Amplitude Modulation and Demodulation
6.0: AM, SSB and DSB Systems
7.0: Angle Modulation
8.0: FM Systems
9.0: RF Transmitters
10.0: RF Receivers

Learning Outcomes:

1.0: Asses requirements and characterize communications systems, and summarize in functional specifications
2.0: Describe the role of modulation and multiplexing in enabling signal transmission
3.0: Interpret the fundamental operation principles of AM and FM systems using mathematics and experimental laboratory techniques
4.0: Design, characterize and measure communication system components and circuits for AM and FM systems
5.0: Discuss the role of Fourier analysis in analyzing time and frequency domain signals
6.0: Apply Fourier analysis to complex signals in the lab environment to asses signal components
7.0: Summarize and compare the operations of AM and FM communication circuits and system using spectrum analyzers, oscilloscopes, and DMMs
8.0: Analyze and build communications circuits to discover and reinforce methods of operations

Implementation date: September 2019

Cost: N/A

ELEN 250 – 3 – 5.5 Analog Communication Systems
New course
Rationale:
This course is part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal Fall and Winter academic semesters. The current term 4 course is an extended semester course; for it to fit in a regular semester, the content in being divided and expanded to address industry needs as directed by the PAC.
Calendar description:
This course is a continuation of the study of communication systems with a focus on radio frequency (RF) transmission and reception systems. Topics include transmission lines, antenna modeling and design, electromagnetic wave propagation, link budgets, RF filter and circuit design, RF amplifier design and characterization, and the analysis and understanding of super high frequency and optical systems. Learners will expand their understanding of communications principles, utilizing mathematics to design, characterize and assess different systems. Skills, theory and techniques will be re-enforced through lab work.
Prerequisites:
ELEN 240, MATH 257
Course outline:

ELEN 250 - Analog Communication Systems

Credit Hours:
3.0
Presentation Format:
Lecture: 3.0 hrs/wk Lab 2.5 hrs/wk Seminar 0.0 hrs/wk
Prerequistes:
ELEN 240: Fundamentals of Communication Systems
MATH 257: Mathematics for Electronic Engineering Technology III
Corequistes:
Description:
This course is a continuation of the study of communication systems with a focus on radio frequency (RF) transmission and reception systems. Topics include transmission lines, antenna modeling and design, electromagnetic wave propagation, link budgets, RF filter and circuit design, RF amplifier design and characterization, and the analysis and understanding of super high frequency and optical systems. Learners will expand their understanding of communications principles, utilizing mathematics to design, characterize and assess different systems. Skills, theory and techniques will be re-enforced through lab work.

Evaluation:
Labs: 15%
Final Exam: 40%
Assignments and Quizzes: 15%
Midterms (2x15): 30%

Major Topics:
1.0: EM Waves and Wave Propagation
2.0: Antenna Design and Modelling
3.0: Transmission Line Modelling and Properties
4.0: Link Budgets and Radiated Power
5.0: RF Filters (Passive and Active Filters)
6.0: RF Amplifiers
7.0: SHF and Optical Systems
8.0: Communication Tests and Measurements

Learning Outcomes:
1.0: Assess, characterize and model transmission line properties for common configurations using the appropriate mathematics and concepts, Assess, characterize and model transmission line properties for common configurations using the appropriate mathematics and concepts
2.0: Identify Basic Antenna configurations, state their properties and perform path loss calculations
3.0: Interpret the fundamental operation principles of RF filters and amplifiers, and analyze and validate with experimental laboratory techniques , Interpret the fundamental operation principles of RF filters and amplifiers, and design, analyze and validate with experimental laboratory techniques
4.0: Evaluate, test, and construct communications circuits and systems, including analysis of communication channel and its effects (e.g. twisted pair wire, coaxial cable, and atmospheric or free space propagation path)
5.0: Analyze and solve communications systems design and functionality issues
6.0: Diagnose and characterize communication systems using test or measurement instrumentation, including spectrum analyzers, communication
analyzers meters, signal monitoring and logging tools, and oscilloscopes
7.0: Analyzie and build communications circuits to discover and re-enforce methods of operations
8.0: Assess requirements and characterize communications systems and clearly summarize these in functional specification

Implementation date: September 2019
Cost: N/A

ELEN 251 – 3 – 5.5 Digital Communication Systems
New course
Rationale:
This course is part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal Fall and Winter academic semesters. The current term 4 course is an extended semester course; for it to fit in a regular semester, the content in being divided and expanded to address industry needs as directed by the PAC.
Calendar description:
This course is a continuation of the study of communication systems with a focus on digital modulation and signaling techniques. Topics include the encoding and decoding of digital data on the communications channel, multiplexing and demultiplexing of data, and principles of digital transmission. Learners will expand their understanding of communications principles, utilizing mathematics to design, characterize and assess different systems. Skills, theory and techniques will be re-enforced through lab work.
Prerequisites:
ELEN 240, MATH 257
Course outline:

ELEN 251 - Digital Communication Systems

Credit Hours:
3.0
Presentation Format:
Lecture: 3.0 hrs/wk Lab 2.5 hrs/wk Seminar 0.0 hrs/wk
Prerequistes:
ELEN 240: Fundamentals of Communication Systems
MATH 257: Mathematics for Electronic Engineering Technology III
Corequistes:
Description:
This course is a continuation of the study of communication systems with a focus on digital modulation and signaling techniques. Topics include the encoding and decoding of digital data on the communications channel, multiplexing and demultiplexing of data, and principles of digital transmission. Learners will expand their understanding of communications principles, utilizing mathematics to design, characterize and assess different systems. Skills, theory and techniques will be re-enforced through lab work.

Evaluation:

Labs: 15%
Midterm (2x15): 30%
Final Exam: 40%
Assignments and Quizzes: 15%

Major Topics:

1.0: Digital Communication Techniques(AD, DA, Serial, Parallel, PCM, PWM)
2.0: Digital Encoding Standards (RS-232, RS-485, RS-422, 4-20mA)
3.0: Multiplexing and Demultiplexing for Digital Signals
4.0: Principles of Digital Transmission, Efficiency, Error Correction and Protocols (includes wireline signals)
5.0: Digital Modulation Systems and Techniques (FSK, PSK, QAM, OFDM), Spread Spectrum

Learning Outcomes:

1.0: Identify basic digital communication techniques, understand and compare and contrast their properties
2.0: Design communications systems using, knowledge of analog and digital electronics, circuit design, computer simulation programs, computer systems, programming, networking, communications protocols, and general engineering principles
3.0: Analyze and solve communications systems design and functionality issues
4.0: Diagnose and characterize communication systems using test or measurement instrumentation, including protocol analyzers, spectrum analyzers, communication analyzers meters, signal monitoring and logging tools, and oscilloscopes
5.0: Interpret fundamental operating principles of given digital modulation techniques using appropriate mathematics and concepts
6.0: Identify the transmitter and receiver operation for ASK, FSK, PSK, QPSK, PSK, QAM, DPSK with digital signals and analyze, design and validate with experimental laboratory techniques
7.0: Evaluate, test, and construct communications circuits for the analysis of wired digital encoding standards and assess and validate with experimental laboratory techniques
8.0: Assess requirements and characterize wireless standards and clearly summarize these in functional specification
9.0: Calculate maximum limits for data transfer rates, network, segment, and drop line lengths

Implementation date: September 2019
Cost: N/A

ELEN 273 – 3 – 5.5 Applications of the Industrial Internet of Things
New course
Rationale:
This course is part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal Fall and Winter academic semesters. This course is being proposed to address industry needs as directed by the PAC.
Calendar description:
This course continues the topics of data communications and automation with a focus on the design, deployment and testing of networked industrial systems. Topics include PLC programming and inter-networking of devices, analysis and application of motors and advanced sensors, understanding and assessing industrial safety and design requirements, HMI design, deploying system infrastructure, systems integration, convergence and acceptance testing. Learners will expand their understanding of the industrial internet of things including testing, designing, commissioning, and maintenance of industrial instrumentation and data communications networks, equipment, media, and software. Skills and techniques will be re-enforced through lab work and a directed project.
Prerequisites:
ELEN 153, ELEN 263
Course outline:

ELEN 273 - Applications of the Industrial Internet of Things

Credit Hours:
3.0
Presentation Format:
Lecture: 3.0 hrs/wk Lab 2.5 hrs/wk Seminar 0.0 hrs/wk
Prerequistes:
ELEN 153: Fundamentals of the Internet of Things
ELEN 263: Control Systems and Automation
Corequistes:
Description:
This course continues the topics of data communications and automation with a focus on the design, deployment and testing of networked industrial systems. Topics include PLC programming and inter-networking of devices, analysis and application of motors and advanced sensors, understanding and assessing industrial safety and design requirements, HMI design, deploying system infrastructure, systems integration, convergence and acceptance testing. Learners will expand their understanding of the industrial internet of things including testing, designing, commissioning, and maintenance of industrial instrumentation and data communications networks, equipment, media, and software. Skills and techniques will be re-enforced through lab work and a directed project.

Evaluation:
Labs: 30%
Midterm : 25%
Final Exam: 30%
Assignments and Quizzes: 15%

Major Topics:
1.0: Advanced PLC Programming and Internetworking
2.0: Advanced Sensor Interfacing
3.0: Industrial System Requirements, Safety and Design
4.0: Human-Machine Interfacing
5.0: Infrastructure Deployment and Responsiveness
6.0: System Integration, Convergence and Acceptance Testing
7.0: AC and DC Motor Control and Interfacing

Learning Outcomes:
1.0: Select and specify automated control systems to meet design specifications
2.0: Create clear functional specification documents given a specific application for automated control systems
3.0: Configure and link PLCs with field devices and other controllers applying a variety of data communication protocols
4.0: Test, design, debug, commission, and maintain graphics for human machine interface applications
5.0: Apply a variety of data communications protocols linking controllers with field devices, other controllers, and industrial data management systems
6.0: Select, specify, and maintain data communications network software applications
7.0: Select, specify, and apply data management software and equipment to collect data and control information for analysis by software systems
8.0: Configure and link PLCs with IoT field devices and other controllers applying a variety of data communication protocols
9.0: Apply a variety of data communications protocols linking controllers with field devices, IoT appliances, other controllers, and industrial data management systems
10.0: Select and specify industrial instrumentation equipment, including process variable sensors, transmitters, signal conditioners, motor controllers and controllers

Implementation date: September 2019
Cost: N/A

ELEN 116 – 3 – 4.5 Programming and Interfacing

Course revision:

- **Calendar description**
- **Prerequisites**
- **Content**
- **Contact hours**

Rationale:

The changes to this course are part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal fall and Winter academic semesters. The course will be delivered in a normal winter semester hence, the content, prerequisite and contact hours have changed.

Calendar description:

Existing:

This course provides the basic skills and concepts required to compile programs on a PC. Software topics include arithmetic and logic operations, variable and constant data, functions, input and output (I/O), the preprocessor, arrays, structures, unions, pointers, file input/output and some standard library functions. Students will be introduced to interfacing and control concepts.

Proposed:

This course provides the basic skills and concepts required to design, write and compile computer programs. Software topics include arithmetic and logic operations, variable and constant data, functions, input and output (I/O), the preprocessor, arrays, structures, unions, pointers and standard library functions. Learners will diagnose, specify, select, and design computer programs using appropriate coding and debugging environments. Course learning outcomes are re-enforced using practical lab applications.

Prerequisites:

Existing	**Proposed**
Admission to the Electronic Engineering Technology program	ELEN126

Content:

An Introduction to microcontroller architecture is added.

Contact hours:

	Existing	**Proposed**
Lecture	2	3
Lab	2.5	2.5
Average weekly contact hours	4.5	5.5

Implementation date: September 2019

Cost: N/A

ELEN 126 – 3 – 6.5 Digital Electronics

Course revision:

- **Calendar description**
- **Prerequisites and corequisites**
- **Content**
- **Contact hours**

Rationale:

The changes to this course are part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal Fall and Winter academic semesters. The course will be delivered in a normal Fall semester hence, the content, prerequisite and contact hours have changed.

Calendar description:

Existing:

This course deals with digital techniques and circuits, number systems and codes, Boolean algebra and Karnaugh Maps, combinational and sequential circuits, MSI (Medium Scale Integration) circuitry and PLDs (Programmable Logic Devices). CPLDs (Complex Programmable Logic Devices) and FPGAs (Field Programmable Gate Arrays) will be programmed using schematic entry and VHDL (Very high speed integrated circuit Hardware Description Language).

Proposed:
This is an introductory course to digital electronics and circuits. Topics covered include digital concepts, number systems and codes, logic gates, latches, flip-flops, combinational and sequential logic analysis and applications. Learners will diagnose, specify, select, design, construct, and characterize digital circuits. Course learning outcomes are re-enforced by practical lab sessions.

Prerequisites and corequisites:

	Existing	Proposed
Prerequisites	ELEN 116	Admission to the Electronic Engineering Technology program
Corequisites	-	ELEN 130

Content:
Reduced coverage of FPGAs (Field Programmable Gate Arrays) and eliminated coverage of VHDL (Very high speed integrated circuit Hardware Description Language).

Contact hours:

	Existing	Proposed
Lecture	4	3
Lab	2.5	2.5
Average weekly contact hours	6.5	5.5

Implementation date: September 2019
Cost: N/A

ELEN 130 – 3 – 7.5 Electrical Circuits
Course revision:

- **Title** – new title – **Electrical Circuit Analysis I**
- **Calendar description**
- **Corequisites**
- **Content**
- **Contact hours**

Rationale:
The changes to this course are part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal Fall and Winter academic semesters. In this particular course, content is changed to focus on DC (direct current) circuits. AC (alternating current) circuits topics are all moving to ELEN140. The 1 hour seminar is removed while the lab time is increased by 30 minutes to allow for more applied training on lab equipment (seminar was used for lab equipment training). Lecture hours are reduced by 1 hour because the AC circuit content was moved to ELEN140

Calendar description:
Existing:
Fundamentals of electricity and magnetism; principles and techniques involved in the analysis of simple resistive and reactive electrical circuits under DC and AC excitation. Laboratory sessions provide for verification of theory through building and testing of circuits using standard components and instruments. Proficiency in reporting of laboratory results is emphasized.
Proposed:
In this course, learners examine the fundamentals of electricity and magnetism as well as the principles and techniques for analyzing resistive and reactive electrical circuits under DC excitation. Topics include series and parallel circuits, circuit analysis methods, resistors, capacitors, and inductors. Laboratory sessions provide for verification of theory through building and testing of circuits using standard components and instruments.

Corequisites:

Existing	Proposed
-	MATH 137

Content:
This course is being changed to focus on DC (direct current) circuits. All AC (alternating current) circuits topics are moving to ELEN140. The removal of this content allows the course to be reduced from 4 lecture hours per week to 3. The other major change is removing the 1 hour of seminar while increasing the lab time by 30 minutes. While this is a net decrease in contact time, some superfluous seminar topics (e.g., software

programs like Altium and Matlab) will be moved to the courses where they are used and efficiencies can be gained by integrating equipment training (which was in seminars) with the lab time.

Contact hours:

	Existing	Proposed
Lecture	4	3
Lab	2.5	3
Seminar	1	0
Average weekly contact hours	7.5	6

Implementation date: September 2019

Cost: N/A

ELEN 140 – 3 – 5.5 Electrical Circuits II

Course revision:

- **Title –** new title **– Electrical Circuit Analysis II**
- **Calendar description**
- **Prerequisites**
- **Content**

Rationale:

Currently, ELEN140 is in an extended semester and we would like to reduce the contact time to regular semester length. In order to do this, some content needs to be removed. Two main topics are being removed from this course. The first is three phase circuits and this topic will be introduced but these type of circuits will not analyzed because power systems are not an important aspect of the Electronic Engineering Technology program. The second is signal coupling circuits and this topic will be moved to ELEN145. Coupling circuits can more be covered with better application in ELEN145 because these types of circuits are more related to communication systems.

Calendar description:

Existing:

Advanced analysis of resistive and reactive passive networks under direct and alternating current excitation; Thevenin's and Norton's Theorems, loop and nodal analysis, superposition, Delta-Wye transformations; practical transformers; resonant circuits; DC and AC bridges; coupling networks. Laboratory projects provide experience with testing representative networks.

Proposed:

In this introductory electrical circuits course, learners analyze, evaluate, and characterize resistive and reactive electrical circuits under alternating current (AC) excitation. Topics include AC signals, reactance, impedance, power, circuit analysis techniques, resonance, filters, and transformers. Laboratory sessions provide for verification of theory through building and testing of circuits using standard components and instruments.

Prerequisites:

Existing	Proposed
ELEN 130	ELEN 130, MATH 137

Content:

The changes to the course content are minimal. The topic of three-phase systems is reduced because the ELEN program does not focus on power systems. Also the topic of couplers will be moved to the analog communications course (ELEN 250)

Implementation date: September 2019

Cost: N/A

ELEN 142 – 3 – 5.5 Fabrication II
Course revision:

- **Title –** new title **– Fabrication I**
- **Calendar description**
- **Prerequisites**
- **Content**
- **Contact hours**

Rationale:
The changes to this course are part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal Fall and Winter academic semesters. The course will be delivered in a normal Winter semester hence the contact hours, course content and description have changed.
Calendar description:
Existing:
An introduction to computer aided drafting including drawing of block diagrams, schematic diagrams, etched circuit board layouts and wiring diagrams. High reliability soldering techniques, component selection and etched circuit board production and wiring harness construction are studied.
Proposed:
This is an introductory course to computer-aided design. Topics covered include drawing of block diagrams, schematic diagrams, circuit board layouts and wiring diagrams. Learners will practice drafting skills used in the electronics industry including sketching, lines, projection drawings, 3D design and dimensioning. Learners will design an electronic project including a PCB and enclosure.
Prerequisites:

Existing	**Proposed**
ELEN 132	-

Content:
Changed the content of both Fabrication I and Fabrication II. Fabrication I focuses on computer aided design and 3D design including schematics, PCB and enclosure design. Fabrication II covers soldering, workshop-based skills and project assembly and testing skills.
Contact hours:

	Existing	**Proposed**
Lecture	2	3
Lab	3.5	2.5
Average weekly contact hours	5.5	5.5

Implementation date: September 2019
Cost: N/A

ELEN 146 – 3 – 5.5 Electronic Circuits
Course revision:

- **Title –** new title **– Electronic Devices and Circuits I**
- **Calendar description**
- **Prerequisites and corequisites**
- **Content**

Rationale:
The changes to this course are part of a larger ELEN program update. Currently, ELEN146 is in an extended semester and we would like to reduce the contact time to regular semester length. In order to do this, some content needs to be removed. The main topics that will be removed from this course are operational amplifiers and special integrated circuits. Operational amplifiers and special integrated circuits are currently covered in ELEN256 and will continue to be covered there.
Calendar description:
Existing:
This course is an introduction to semiconductor devices such as diodes, BJTs (bipolar junction transistors), FETs (field effect transistors) and simple integrated circuits. Topics coved will include discrete amplifiers, operational amplifiers and special integrated circuits. Lab projects will provide experience in constructing, testing and troubleshooting electronic circuits and systems.

Proposed:
In this introductory electronic circuits and devices course learners will diagnose, specify, select, design and construct circuits containing electronic devices. Topics include semiconductor materials, diodes, general amplifier theory, bipolar junction transistors (BJTs), and field effect transistors (FETs). Learners will analyze, characterize, and design circuits such as amplifiers, voltage regulators, switches, and current sources. Laboratory sessions provide learners with an opportunity to verify electronic circuit theory by building and testing circuits using standard components and instruments.

Prerequisites and corequisites:

	Existing	Proposed
Prerequisites	ELEN 136	ELEN 130
Corequisites	-	ELEN 140

Content:
Operational amplifiers and special integrated circuits are being removed from the course. These topics are already covered in ELEN256 and will continue to be covered there.

Implementation date: September 2019
Cost: N/A

ELEN 216 – 3 – 6 Microcontroller Technology

Course revision:

- **Calendar description**
- **Prerequisites**
- **Content**

Rationale:
The changes to this course are part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal Fall and Winter academic semesters. The course description was streamlined and formatted to the new standard ELEN course description.

Calendar description:
Existing:
This course deals with the architecture, programming, and interfacing of microcontrollers. Hardware topics include memory, input/output, counters/timers, serial communications and interrupts. Interface projects will be written in Assembly and C and include switches, LEDs (Light Emitting Diodes), A/D (Analog to Digital) converters, stepper motors, and liquid crystal displays.
Proposed:
This course deals with the architecture, programming, and interfacing of microcontrollers. Topics include microcontroller architecture, memory, input/output, interrupts, counters, timers, parallel and serial communications. Interface projects will be written in assembly and C and include switches, LEDs, A/D, D/A, LCD, keypad interfacing, serial communication utilizing RS232 and RS485. Learners will diagnose, specify, select, design, and construct, micro-controller based systems. Course learning outcomes are re-enforced by practical lab sessions.

Prerequisites:

Existing	Proposed
ELEN 126 or COSC 150 or NTEN 126	ELEN 116, ELEN 126

Content:
Microcontroller architecture content is significantly reduced and replaced by the topics of LCD and keypad interfacing.

Implementation date: September 2019
Cost: N/A

ELEN 226 – 3 – 4.5 Embedded Systems
Course revision:

- **Calendar description**
- **Content**
- **Contact hours**

Rationale:
The changes to this course are part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal Fall and Winter academic semesters. Eliminated the term project component of the course. The course will be delivered in a normal winter semester hence the contact hours have changed.
Calendar description:
Existing:
The course deals with microcontroller-based embedded systems and hardware/software co-design. Topics include interrupt based programming, DC motors, temperature sensors, external EEPROM, real-time clock, Inter Integrated Circuits (I2C), Serial Peripheral Interface (SPI) and 1-Wire serial interfacing. The course will also include an introduction to digital signal processors. The course culminates in the design and implementation of a term microcontroller-based project
Proposed:
This course deals with microcontroller-based embedded systems and hardware/software co-design. Topics include interrupt based programming, DC motor control, temperature sensors acquisition, external EEPROM, real-time clock, Inter Integrated Circuits (I2C), Serial Peripheral Interface (SPI) and 1-Wire serial interfacing. Learners will diagnose, specify, design, and construct, micro-controller based systems. Course learning outcomes are re-enforced by practical lab sessions.
Content:
Eliminated the term project component of the course.
Contact hours:

	Existing	Proposed
Lecture	2	3
Lab	2.5	3
Average weekly contact hours	4.5	6

Implementation date: September 2019
Cost: N/A

ELEN 227 – 3 – 4.5 Report and Project
Course revision:

- **Calendar description**
- **Prerequisites**
- **Content**
- **Contact hours**
- **Credits**

Rationale:
The changes to this course are part of an overall curriculum change intended to ensure ELEN graduate skill sets match industry needs and to reduce the number of courses offered outside of the normal Fall and Winter academic semesters. The course will be delivered in a normal Winter semester and as a result, the number of contact hours has been increased to address the learning objectives. Project planning and management has been moved to proposed prerequisite course.
Calendar description:
Existing:
In this course students will be expected to manage and electronic design project from concept to completion and demonstrate a working prototype. Project management from a time and financial perspective will be stressed. A formal report and an oral presentation to the class will be required.
Proposed:
This course is a continuation of Engineering Project Management. In this course, learners will execute their project plan and manage an electronic design project from concept to completion. The course will conclude

with demonstration of a working prototype based on defined requirements, scope and budget. Learners will produce a formal written report and give an oral presentation based on specific project work.

Prerequisites:

Existing	Proposed
-	ELEN 213, ELEN 256, ELEN 240, ELEN 152

Content:

Project management and planning is being moved to prerequisite course. Course will include aspects of formal report writing and documentation.

Contact hours:

	Existing	Proposed
Lecture	2	3
Lab	2.5	5
Average weekly contact hours	4.5	8

Credits:

Existing	Proposed
3	6

Implementation date: September 2019

Cost: N/A

ELEN 256 – 3 – 5.5 Analog Digital Signal Processing

Course revision:

- **Title –** new title **– Electronic Devices and Circuits II**
- **Calendar description**
- **Prerequisites**
- **Content:**
- **Contact hours:**

Rationale:

The changes to this course are part of an overall curriculum re-design and involve changing the focus of the course from analog and digital signal processing to analog signal processing only. Digital signal processing is not a program strength so the topic is being removed from this course and will be covered in lesser detail in ELEN251.

Calendar description:

Existing:

Advanced applications of operational amplifiers and special integrated circuits are covered with an emphasis on high performance analog signal processing leading to data acquisition and digital signal processing by computers. Major topics include the classes of negative feedback, nonideal operational amplifier properties, active filters, data acquisition principles, and digital signal processing.

Proposed:

In this course, learners examine advanced analog circuits with an emphasis on analog signal processing and data acquisition. Major topics include classes of negative feedback, nonideal operational amplifiers, active filters and data acquisition principles. Learners focus on analysis and design of systems for filtering/processing analog signals and capturing signals in digital form. Laboratory sessions provide learners with an opportunity to verify circuit theory by building and testing circuits using standard components and instruments.

Prerequisites:

Existing	Proposed
ELEN 146	ELEN 140, ELEN 146

Content:

ELEN256 will start with an introduction to operational amplifiers because that topic will be removed from ELEN146. ELEN256 will also give more focus to active filter design and analysis while digital filter design and analysis will be removed from this course and covered to a lesser extent in ELEN251

Contact hours:

	Existing	Proposed
Lecture	3	3

Lab	2.5	3
Average weekly contact hours	5.5	6

Implementation date: September 2019
Cost: N/A

ELEN 263 – 3 – 5.5 Control Systems
Course revision:

- **Title –** new title **– Control Systems and Automation**
- **Calendar description**
- **Prerequisites and corequisites**
- **Content**
- **Contact hours**

Rationale:
The changes to this course are part of an overall curriculum re-design which involves eliminating the extended semester in the Winter semester and updating topics to be more in line with industry requirements. This particular course currently has an extended semester, so in order to fit it in to a regular semester, some of the content needs to be removed.
Calendar description:
Existing:
This course includes fundamental techniques and elements of closed-loop feed-back control of industrial processes and systems, and a study of servomechanisms and digital control.
Proposed:
In this course, learners examine the fundamental techniques and elements of closed-loop feedback control systems. Topics include sensors and actuators, control system modeling and responses, servomechanisms, and programmable logic controllers (PLCs). Learners analyze and model real world systems in both open loop and closed loop configurations while focusing on characterization of control system performance and response. Laboratory sessions provide learners with an opportunity to verify electronic circuit theory by building and testing circuits using standard components and instruments.
Prerequisites and corequisites:

	Existing	**Proposed**
Prerequisites	MATH257, ELEN256	-
Corequisites	-	MATH257, ELEN256

Content:
Digital control techniques will be removed from the course while an introduction to programmable logic controllers will be added. The coverage of sensors will be reduced to fit all of the topics in to the course and the new courses ELEN153 (Fundamentals of the Internet of Things) and ELEN273 (Applications of the Industrial Internet of Things) will include sensors to ensure adequate coverage of the topic in the program. The increased lab time is necessary to allow for adequate time to complete labs. Currently, lab topics are reduced or students need to come in during open lab hours to complete labs.
Contact hours:

	Existing	**Proposed**
Lecture	3	3
Lab	2.5	3
Average weekly contact hours	5.5	6

Implementation date: September 2019
Cost: N/A

Electronic Engineering Technology
Program revision:

- **Program name –** new name **– Electronics Engineering Technology**
- **Program description**
- **Revision of course**
- **Addition of courses**
- **Program outline**

Rationale:
The two primary reasons for this program revision are to reduce the extended Winter semester from 4 extra weeks per year to 2 extra weeks in the first year and to update the program to better fit the skill set that industry requires. While implementing this change we also needed to ensure that learners would still get the same level of education. Consultation with the program advisory committee and others in the electronics industry helped us identify the important technical skills and knowledge as well as soft skills required of graduates. Using this information as well as input from Technology Accreditation Canada, the body that accredits our program, we were able to remove unneeded content and add more relevant content.
Program description:
This diploma program provides training in analog and digital electronic systems and equipment. The program places equal emphasis on a thorough understanding of circuit and systems concepts/applications and proper techniques for building, testing, and measuring circuits and systems.
Graduates find employment in the areas of communications, microcontroller applications, embedded system applications, systems control and automation. Many jobs relate to the installation, operation, maintenance, and design of complex electrical and electronic equipment. Graduates work for a wide range of government agencies, private companies and educational institutions. Some graduates are employed as assistants to scientists and engineers on research and development projects. With the increasing growth in the industrial Internet of Things (IoT) which includes both networked and automated control systems, there is strong demand for technologists with knowledge of analog systems, digital systems and networking.
The Electronics Engineering Technology program offers graduates the opportunity to bridge in to engineering degree programs at University of British Columbia - Okanagan, University of Victoria and Lakehead University.
National Accreditation: The Electronics Engineering Technolgoy program is nationally accredited by Technology Accreditation Canada (TAC). The program's strengths include Analog Systems, Microcontrollers, Communications Systems, and Industrial Data Communications and Networking. While attending Okanagan College, students may register with Applied Science Technologists and Technicians of BC (ASTTBC). Following graduation and a few years of industry experience, graduates can apply to become Applied Science Technologists (AScT).
Revision of course:
ELEN 116, ELEN 126, ELEN 130, ELEN 140, ELEN 142, ELEN 146, ELEN 216, ELEN 256, ELEN 226, ELEN 227, ELEN 263
Addition of courses:
ELEN 110, ELEN 152, ELEN 153, ELEN 213, ELEN 240, ELEN 250, ELEN 251, ELEN 273
Program outline:

Existing		Proposed	
Semester 1	**Fall - 16 Weeks**	**Semester 1**	**Fall - 16 Weeks**
ELEN115	Computer Components and Peripherals	ELEN110	Computer Fluency
ELEN116	Programming and Interfacing	ELEN126	Digital Electronics
ELEN130	Electrical Circuits	ELEN130	Electrical Circuit Analysis I
ELEN132	Fabrication 1	PHYS126	Physics for Electronics Eng. Tech
ELEN136	Introduction to Electronics	CMNS133	Technical Writing and Communications I
MATH137	Math for Electronic Eng. Tech 1	MATH137	Math for Electronic Eng. Tech 1
Semester 2	**Winter - 20 Weeks**	**Semester 2**	**Winter - 16 Weeks**

ELEN126	Digital Electronics	ELEN116	Programming and Interfacing
ELEN140	Electrical Circuits II	ELEN140	Electrical Circuit Analysis II
ELEN142	Fabrication II	ELEN142	Fabrication I
ELEN145	Communication I	ELEN146	Electronic Devices and Circuits
ELEN146	Electronic Circuits	ELEN153	Fundamentals of the Internet of Things
MATH147	Math for Electronic Eng. Tech 2	MATH147	Math for Electronic Eng. Tech 2
		ELEN152	**Fabrication II**
Semester 3	**Fall - 16 Weeks**	**Semester 3**	**Fall - 16 Weeks**
ELEN215	Computer Systems II	ELEN213	Engineering Project Management
ELEN216	Microcontroller Technology	ELEN216	Microcontroller Technology
ELEN254	Analog and Digital Systems I	ELEN240	Fundamentals of Communication Systems
ELEN256	Analog and Digital Signal Processing	ELEN256	Electronic Devices and Circuits II
MATH257	Math for Electronic Eng. Tech 3	ELEN263	Control Systems and Automation
PHYS125	Physics for Electronic Eng. Tech	MATH257	Math for Electronic Eng. Tech 3
Semester 4	**Winter - 20 Weeks**	**Semester 4**	**Winter - 16 Weeks**
ELEN226	Embedded Systems	ELEN226	Embedded Systems
ELEN227	Project and Report	ELEN227	Project and Report
ELEN263	Control Systems	ELEN250	Analog Communication Systems
ELEN264	Analog and Digital Systems II	ELEN251	Digital Communication Systems
ELEN265	Communications II	ELEN273	Applications of the Industrial Internet of Things
CMNS132	Technical Communications		

Implementation date: September 2019
Cost: N/A

MATH 147 – 3 – 3 **Mathematics for Electronic Engineering Technology II**
Course revision:

- **Contact hours**

Rationale:
The change in this course is part of the update to the Electronic Engineering Technology program revision. The proposed program revision will cut 4 weeks off of the winter semester to make the semester the same length as it is in other programs. In order to keep the course content the same, one hour of lecture per week needs to be added.
Contact hours:

	Existing	Proposed
Lecture	3	4
Average weekly contact hours	3	4

Implementation date: September 2019

Cost: N/A

DSCI 100 – 3 – 4 **Introduction to Data Science 1**
New course
Rationale:
This is the first course in the Post-Baccalaureate Diploma in Marketing and Data Analytics.
Calendar description:
This course is an introduction to Data Science. The class will discuss what data science actually is, the structure of a data science project, formulating data science questions and identifying a successful data science project. Topics include: getting and cleaning data, code books, dealing with different data types, missing data, experimental design, and visualization techniques.
Prerequisites:
ABE Math 12 (minimum 67%), Principles of MATH 12 (minimum 67%), Pre-calculus 12 (minimum 67%), MATH 120 or admission to the Okanagan College Post-Baccalaureate Diploma in Marketing and Data Analytics.
Course outline:

DSCI 100 Introduction to Data Science 1

ProfessorInformation

TBA

SectionInformation

Section: 01
Credits: 3
Prerequisite: Any of:

- ABE MATH 12 (minimum grade of 67%),
- Principles of MATH 12 (minimum grade of 67%),
- Pre-Calculus 12 (minimum of 67%),
- MATH 120,
- Admission to the Okanagan College Post-Baccalaureate Diploma in Marketing and Data Analytics

Corequisite: DSCI 110.

Presentation format:

Lecture: 4 hours per week
Lab: No lab

Calendar Description

This course is an introduction to Data Science. The class will discuss what data science actually is, the structure of a data science project, formulating data science questions and identifying a

successful data science project. Topics include: getting and cleaning data, code books, dealing with different data types, missing data, experimental design, visualization techniques, exploratory analysis, common data analysis mistakes and an introduction to regression analysis.

Transfer Information

Please refer to the transfer guide table for the course available online at the following link, students are encouraged to save a copy of current transfer information for their own records.
http://www.bctransferguide.ca

Course Materials

The required texts for this course are:

The Elements of Data Analytic Style – *Jeff Leek*
Statistical inference for Data Science – *Brian Caffo*
OpenIntro Statistics – *David Diez, Christopher Barr, Mine Cetinkaya-Rundel*
R Programming for Data Science – *Roger D. Peng*

Course Content

Below you will find a synopsis of probable course content.

1. The data analytic question
2. Tidying data
3. Checking data
4. Exploratory analysis
5. A brief introduction to statistical modelling and inference
6. A brief introduction to prediction and machine learning
7. Causality
8. Written analysis
9. Creating figures
10. Presenting data
11. Reproducibility
12. The data analysis checklist
13. Regression (and logistic regression)

Learning Outcomes

The following are the anticipated learning outcomes of the course.

1. How to describe the structure of a data science project,
2. How to formulate appropriate data science questions,
3. How to identify a successful and an unsuccessful data science project,
4. Know the key terms and tools used by data scientists,

5. How to get and clean data,
6. How to deal with different types of data (categorical, continuous, ordinal, missing, censored),
7. How to use techniques for handling missing data,
8. How statistics, machine learning, and software engineering play a role in data science,
9. How to identify strengths and weaknesses in experimental designs,
10. How to effectively use visualization techniques in a data science setting,
11. How to use regression (and logistic regression) for a basic data science project.

Course Evaluation

Your grade in this course will be broken down as follows:

Assignments and Quizzes	25%
Midterm Exam	30%
Final Exam	45%

Where:

- **Quizzes and Assignments** will be given on a nearly weekly basis.
- **The final exam** will be cumulative and held at a place and time determined by Okanagan College.

Important Dates

The dates given below are as of the time of writing. Please check to ensure that they have not changed: http://webapps-5.okanagan.bc.ca/ok/calendar/calendar.aspx

Classes begin:	Monday,
Last day to register:	Friday,
Last day to receive refund:	Friday,
Last day to drop without being recorded on transcript:	Friday,
Last day to withdraw without academic penalty:	Friday,
Final exam period:	Thursday,

Course Policies

Calculator policy: A basic scientific calculator is necessary and sufficient for this course. Graphing calculators may be used in class but will not be permitted for use on midterms and the final exam. Cellular phones and other internet enabled devices are not acceptable calculators.

Missed midterm policy: Makeup midterms will not be given in this course. Rather, the percentage grade for a missed midterm will be replaced by the percentage grade earned on the final exam.

Department Policies

- Failure to achieve a grade of at least 40% on the final exam of a course will result in a failing grade for the course.
- When a student fails a course as a result of failing to achieve a final exam grade of 40%, the maximum grade that will be awarded is 49%.
- Calculators used for exams will satisfy the department's calculator policy. For this course, students are allowed a non-graphing, scientific calculator.

Implementation date: September 2019
Cost: N/A

DSCI 101 – 3 – 4 **Introduction to Data Science 2**
New course
Rationale:
This is the second semester data science course in the Post-Baccalaureate Diploma in Marketing and Data Analytics.
Calendar description:
This course is a continuation of Introduction to Data Science I. Topics include: Exploratory graphs, plotting systems, hierarchical clustering, k-means clustering, dimension reduction, principle component analysis, and singular value decomposition.
Prerequisites:
DSCI 100 and DSCI 110
Course outline:

DSCI 101 Introduction to Data Science 2

Professor Information

TBA

Section Information

Section:	01
Credits:	3
Prerequisite:	DSCI 100 and DSCI 110.
Corequisite:	None.

Presentation format:

Lecture:	4 hours per week
Lab:	No lab

Calendar Description

This course is a continuation of Introduction to Data Science I. Topics include: Exploratory graphs, plotting systems, hierarchical clustering, *k*-means clustering, dimension reduction, principle component analysis, and singular value decomposition.

Transfer Information

Please refer to the transfer guide table for the course available online at the following link, students are encouraged to save a copy of current transfer information for their own records.

http://www.bctransferguide.ca

Course Materials

The required texts for this course are:

Exploratory Data Analysis with *R* – *Roger D. Peng*

The Art of Data Science – *Roger D. Peng, Elizabeth Matsui*

OpenIntro Statistics – *David Diez, Christopher Barr, Mine Cetinkaya-Rundel*

R Programming for Data Science – *Roger D. Peng*

Course Content

Below you will find a synopsis of probable course content.

1. Basic Principles for data analysis
2. Getting and cleaning data
3. Plotting systems
4. Principles of analytic graphs
5. Exploratory graphs
6. Hierarchical clustering

7. *k*-means clustering
8. Principle component analysis
9. Singular value decomposition
10. Dimension reduction

Learning Outcomes

The following are the anticipated learning outcomes of the course.

1. Understand and use *R* plotting systems for exploratory analysis,
2. Understand the principles of analytic graphs,
3. Create and interpret exploratory graphs,
4. Understand and use various clustering techniques such as principle component analysis (PCA), singular value decomposition (SVD), *k*-means and Hierarchical clustering in a data science setting,
5. Understand and use the ideas of dimension reduction,
6. Describe the core differences in analyses enabled by regression, classification, and clustering,
7. Interpret the results from common data analyses.

Course Evaluation

Your grade in this course will be broken down as follows:

Assignments and Quizzes	25%
Midterm Exam	30%
Final Exam	45%

Where:

- **Quizzes and Assignments** will be given on a nearly weekly basis.
- **The final exam** will be cumulative and held at a place and time determined by Okanagan College.

Important Dates

The dates given below are as of the time of writing. Please check to ensure that they have not changed: http://webapps-5.okanagan.bc.ca/ok/calendar/calendar.aspx

Classes begin:	Monday,
Last day to register:	Friday,
Last day to receive refund:	Friday,
Last day to drop without being recorded on transcript:	Friday,

Last day to withdraw without academic penalty:	Friday,
Final exam period:	Thursday,

Course Policies

Calculator policy: A basic scientific calculator is necessary and sufficient for this course. Graphing calculators may be used in class but will not be permitted for use on midterms and the final exam. Cellular phones and other internet enabled devices are not acceptable calculators.
Missed midterm policy: Makeup midterms will not be given in this course. Rather, the percentage grade for a missed midterm will be replaced by the percentage grade earned on the final exam.

Department Policies

- Failure to achieve a grade of at least 40% on the final exam of a course will result in a failing grade for the course.
- When a student fails a course as a result of failing to achieve a final exam grade of 40%, the maximum grade that will be awarded is 49%.
- Calculators used for exams will satisfy the department's calculator policy. For this course, students are allowed a non-graphing, scientific calculator.

Implementation date: September 2019
Cost: N/A

DSCI 110 – 3 – 4 **Mathematical Computation**
New course
Rationale:
This is the first data science course in the Post-Baccalaureate Diploma in Marketing and Data Analytics .
Calendar description:
This course introduces some of the software commonly used by mathematicians & statisticians including R (and R studio), Excel, and LaTeX. Students will learn techniques for dealing with data, databases and version control. No prior computer skills are required for this course; however, familiarity with computers is considered an asset.
Prerequisites:
Pre-calculus 12 (minimum 67%), Principles of MATH 12 (minimum 67%), Pre-calculus 12 (minimum 67%), MATH 120 or admission to the Okanagan College Post-Baccalaureate Diploma in Marketing and Data Analytics.
Course outline:

DSCI 110 Mathematical Computation

Professor Information

TBA

Section Information

Section:	01
Credits:	3

Prerequisite: Any of

- ABE MATH 12 (minimum grade of 67%)
- Principles of MATH 12 (minimum grade of 67%)
- Pre-calculus 12 (minimum grade of 67%)
- MATH 120,
- or admission to the Okanagan College Post-Baccalaureate Diploma in Marketing and Data Analytics

Corequisite: None.

Presentation format:

Lecture:	4 hours per week
Lab:	No lab

Calendar Description

This course introduces some of software commonly used by mathematicians & statisticians including *R* (and *R* studio), Excel, and *LaTeX*. Students will learn techniques for dealing with data, data bases and version control. No prior computer skills are required for this course; however, familiarity with computers is considered an asset.

Transfer Information

Please refer to the transfer guide table for the course available online at the following link, students are encouraged to save a copy of current transfer information for their own records.

http://www.bctransferguide.ca

Course Materials

The required texts for this course are:

R Programming for Data Science – *Roger D. Peng*

OpenIntro Statistics – *David Diez, Christopher Barr, Mine Cetinkaya-Rundel*

Course Content

Below you will find a synopsis of probable course content.

1. Introduction to Excel
2. Introduction to *R*
3. Reading and writing data in *R*
4. Visualization in *R*
5. Basic programming in *R*
6. Debugging
7. *R*-studio basics

8. *LaTeX*
9. version control

Learning Outcomes

The following are the anticipated learning outcomes of the course.

1. Comfortably use R,
2. Comfortably use knitr
3. Comfortably use Excel
4. Comfortably use LaTeX
5. Use techniques for handling missing data
6. Know a little bit about databases including why they are necessary and their potential drawbacks
7. Use repositories such as Github for version control
8. Discuss why version control is important
9. Be comfortable with basic programming skills
10. Be able to effectively visualize data in R
11. Be able to deal with various data structures in R
12. Read and write data in R
13. Deal with dates and times in R
14. Know and apply scoping rules in R
15. Use Loop functions in R
16. Be able to debug in R
17. Be able to run a simulation in R

Course Evaluation

Your grade in this course will be broken down as follows:

Assignments and Quizzes	25%
Midterm Exam	30%
Final Exam	45%

Where:

- **Quizzes and Assignments** will be given on a nearly weekly basis.
- **The final exam** will be cumulative and held at a place and time determined by Okanagan College.

Important Dates

The dates given below are as of the time of writing. Please check to ensure that they have not changed: http://webapps-5.okanagan.bc.ca/ok/calendar/calendar.aspx

Classes begin:	Monday,
Last day to register:	Friday,
Last day to receive refund:	Friday,
Last day to drop without being recorded on transcript:	Friday,
Last day to withdraw without academic penalty:	Friday,
Final exam period:	Thursday,

Course Policies

Calculator policy: A basic scientific calculator is necessary and sufficient for this course. Graphing calculators may be used in class but will not be permitted for use on midterms and the final exam. Cellular phones and other internet enabled devices are not acceptable calculators.
Missed midterm policy: Makeup midterms will not be given in this course. Rather, the percentage grade for a missed midterm will be replaced by the percentage grade earned on the final exam.

Department Policies

- Failure to achieve a grade of at least 40% on the final exam of a course will result in a failing grade for the course.
- When a student fails a course as a result of failing to achieve a final exam grade of 40%, the maximum grade that will be awarded is 49%.
- Calculators used for exams will satisfy the department's calculator policy. For this course, students are allowed a non-graphing, scientific calculator.

Implementation date: September 2019
Cost: N/A

DSCI 200 – 3 – 4 **Introduction to Data Science 3**
New course
Rationale:
This is the second year data science course in the Post-Baccalaureate Diploma in Marketing and Data Analytics.
Calendar description:
This course covers advanced topics in Data Science. Topics include: support vector machines, neural networks, optimization, supervised versus unsupervised learning, over-fitting, receiver operating characteristic curves, prediction with regression, prediction with decision trees, prediction with random forests, boosting and prediction blending.
Prerequisites:
DSCI 101
Course outline:

DSCI 200 Introduction to Data Science 3

Professor Information

TBA

Section Information

Section:	01
Credits:	3
Prerequisite:	DSCI 101.
Corequisite:	None.

Presentation Format:

Lecture:	4 hours per week
Lab:	No lab

Calendar Description

This course covers advanced topics in Data Science. Topics include: support vector machines, neural networks, optimization, supervised versus unsupervised learning, over-fitting, receiver operating characteristic curves, prediction with regression, prediction with decision trees, prediction with random forests, boosting and prediction blending.

Transfer Information

Please refer to the transfer guide table for the course available online at the following link, students are encouraged to save a copy of current transfer information for their own records.

http://www.bctransferguide.ca

Course Materials

The required texts for this course are:

Practical Machine Learning – *Sunila Gollapudi*

OpenIntro Statistics – *David Diez, Christopher Barr, Mine Cetinkaya-Rundel*

R Programming for Data Science – *Roger D. Peng*

Course Content

Below you will find a synopsis of probable course content.

1. Prediction study design
2. In sample and out of sample errors
3. Over-fitting
4. Receiver Operating Characteristic (ROC) curves
5. Preprocessing and feature creation
6. Prediction with regression

7. Prediction with decision trees
8. Prediction with random forests
9. Boosting
10. Prediction blending

Learning Outcomes

The following are the anticipated learning outcomes of the course.

1. Understand the concept of support vector machines in a data science setting,
2. Understand the concept of neural networks in a data science setting,
3. Understand how to use optimization in a data science setting,
4. Understand the basic concepts of supervised versus unsupervised learning,
5. Understand the problem of over-fitting and under-fitting,
6. Work with receiver operating characteristic curves,
7. Make basic predictions using a variety of methods including regression, decision trees, random forests and prediction blending.

Course Evaluation

Your grade in this course will be broken down as follows:

Assignments and Quizzes	25%
Midterm Exam	30%
Final Exam	45%

Where:

- **Quizzes and Assignments** will be given on a nearly weekly basis.
- **The final exam** will be cumulative and held at a place and time determined by Okanagan College

Important Dates

The dates given below are as of the time of writing. Please check to ensure that they have not changed: http://webapps-5.okanagan.bc.ca/ok/calendar/calendar.aspx

Classes begin:	Monday,
Last day to register:	Friday,
Last day to receive refund:	Friday,
Last day to drop without being recorded on transcript:	Friday,
Last day to withdraw without academic penalty:	Friday,

Final exam period: Thursday,

Course Policies

Calculator policy: A basic scientific calculator is necessary and sufficient for this course. Graphing calculators may be used in class but will not be permitted for use on midterms and the final exam. Cellular phones and other internet enabled devices are not acceptable calculators.
Missed midterm policy: Makeup midterms will not be given in this course. Rather, the percentage grade for a missed midterm will be replaced by the percentage grade earned on the final exam.

Department Policies

- Failure to achieve a grade of at least 40% on the final exam of a course will result in a failing grade for the course.
- When a student fails a course as a result of failing to achieve a final exam grade of 40%, the maximum grade that will be awarded is 49%.
- Calculators used for exams will satisfy the department's calculator policy. For this course, students are allowed a non-graphing, scientific calculator.

Implementation date: September 2019
Cost: N/A

DSCI 390 – 3 – 4 Data Science Project
New course
Rationale:
This is the final project course in the Post-Baccalaureate Diploma in Marketing and Data Analytics .
Calendar description:
This project course is dedicated to the analysis of theoretical and practical aspects of selected examples of data science. It forms the application and extension of knowledge from previous and current courses as it relates to practical data science scenarios. Students will be required to submit a technical report based on a major data science project and do a presentation before a selected audience.
Prerequisites:
DSCI 200
Course outline:

DSCI 390 Data Science Project

Professor Information

TBA
Section Information

Section:	01
Credits:	3
Prerequisite:	DSCI 200.
Corequisite:	None.

Presentation format:

Lecture:	3 hours per week
Lab:	No lab

Calendar Description

This project course is dedicated to the analysis of theoretical and practical aspects of selected examples of data science. It forms the application and extension of knowledge from previous and current courses as it relates to practical data science scenarios. Students will be required to submit a technical report based on a major data science project and do a presentation before a selected audience. (3,0,0)

Transfer Information

Please refer to the transfer guide table for the course available online at the following link, students are encouraged to save a copy of current transfer information for their own records.

http://www.bctransferguide.ca

Course Materials

There are no required texts for this course. Students will take advantage of resources from other courses.

Course Content

Below you will find a synopsis of probable course content.

1. Establishing the scope of the work
2. Setting a timeline
3. Documenting the project
4. Preparing a status report
5. Preparing the oral presentation
6. Preparing the final report

Course Evaluation

Your grade in this course will be broken down as follows:

Status Reports	20%
Quizzes	20%
Presentation	20%
Written Report	20%
Final Exam	20%

Where:

- **Quizzes and Status Reports** will be given on a regular basis.
- **The final exam** will be cumulative and held at a place and time determined by Okanagan College.

Important Dates

The dates given below are as of the time of writing. Please check to ensure that they have not changed:

http://webapps-5.okanagan.bc.ca/ok/calendar/calendar.aspx

Classes begin:	Monday,
Last day to register:	Friday,
Last day to receive refund:	Friday,
Last day to drop without being recorded on transcript:	Friday,
Last day to withdraw without academic penalty:	Friday,
Final exam period:	Thursday,

Course Policies

Calculator policy: A basic scientific calculator is necessary and sufficient for this course. Graphingcalculators may be used in class but will not be permitted for use on midterms and the final exam. Cellular phones and other internet enabled devices are not acceptable calculators.

Missed midterm policy: Makeup midterms will not be given in this course. Rather, the percentage grade for a missed midterm will be replaced by the percentage grade earned on the finalexam.

Department Policies

- Failure to achieve a grade of at least 40% on the final exam of a course will result in a failing grade for the course.
- When a student fails a course as a result of failing to achieve a final exam grade of 40%, the maximum grade that will be awarded is 49%.
- Calculators used for exams will satisfy the department's calculator policy. For this course, students are allowed a non-graphing, scientific calculator.

Implementation date: September 2019
Cost: N/A

MATH 251 – 3 – 4 **Introduction to Discrete Structures**
(COSC 221)
Course revision:

- **Prerequisites**

Rationale:
Want to use the course in the Post-Baccalaureate Diploma in Marketing and Data Analytics so we need a prerequisite change.
Prerequisites:

Existing	Proposed
MATH 112 or MATH 139 or MATH 147 or MATH 149 or MATH 221	MATH 112 or MATH 139 or MATH 147 or MATH 149 or MATH 221 or MATH 314

Implementation date: July 2019
Cost: N/A

MATH 314 – 3 – 3 **Calculus and Linear Algebra with Business Applications**
Course revision:

- **Prerequisites**

Rationale:
Want to use the course in the Post-Baccalaureate Diploma in Marketing and Data Analytics so we need a prerequisite change.
Prerequisites:

Existing	Proposed
MATH 114 & 3rd year standing	MATH 114 & 3rd year standing OR Admission to the Post-Baccalaureate Diploma in Marketing and Data Analytics

Implementation date: July 2019
Cost: N/A

STAT 230 – 3 – 4 **Elementary Applied Statistics**
(BIOL 202)
Course revision:

- **Prerequisites**

Rationale:
Want to use the course in the Post-Baccalaureate Diploma in Marketing and Data Analytics so we need a prerequisite change.
Prerequisites:

Existing	Proposed
MATH 112	Admission to the Post-Baccalaureate in Marketing and Data Analytics OR Prerequisite MATH 112 and corequisite MATH 122

Implementation date: July 2019
Cost: N/A

STAT 310 – 3 – 3 **Regression Analysis**
Course revision:

- **Prerequisites**

Rationale:
Want to use the course in the Post-Baccalaureate Diploma in Marketing and Data Analytics so we need a prerequisite change.

Prerequisites:

Existing	Proposed
STAT 230 and MATH 221 or Admission to the Post Baccalaureate Degree in Marketing and Data Analysis	STAT 230 and MATH 221 or Admission to the Post-Baccalaureate Diploma in Marketing and Data Analytics

Course outline: Implementation date: July 2019
Cost: N/A

Post-Baccalaureate Diploma in Marketing and Data Analytics
New program
Rationale:
Target Student:
The proposed Okanagan College Post-Baccalaureate Diploma in Marketing and Data Analytics (PBDMDA) program is designed for individuals who have completed a bachelor degree in any business or science program looking for further education in the new and exciting area of marketing and data analytics.
Labour Market and Industry:
Data Analytics is a sub-discipline of Data Science. The job of a data scientist has been referred to as "The Sexiest Job of the 21st Century" ([Davenport and Patil, 2012]). The same article goes on to state that "The shortage of data scientists is becoming a serious constraint in some sectors". Thus, there appears to be an opportunity for OC to serve our community by training students in the area of Marketing and Data Analytics.
A McKinsey Global Institute (MGI) report ([Manyika et al., 2011]) predicts a 40% growth in global data volume annually and a 5% annual growth in global information technology (IT) spending. The report states that the US healthcare system could realize a $300 billion yearly savings by exploiting data science. Retailers, using data science, could increase operating margins by more than 60%.
The follow-on MGI report ([Henke et al., 2016]) asserts that most companies are not capturing the full value of their data. In this regard, the recruitment and retention of appropriate talent are highlighted as significant constraints. The shortage of data scientists is projected to grow to 250,000 by 2026.
In order to estimate the future demand for data scientists, MGI published a set of required job skills: statistical modelling, predictive analytics, predictive modelling, natural language processing, logistic regression, support vector machines, neural networks, naive Bayes, k-means, principal components analysis, Python, and R. Most of these skills are developed in the PBDMDA.
MGI defines the role of the business translator. Business translators are professionals that have a firm backgrounds in business and also understand the technical concepts associated with data science. Business translators can summarize the results of complex data science investigations for senior management. MGI suggests that the ratio of business translators to pure data scientists should be between 4:1 and 8:1 in organizations trying to extract maximum value from their data. Consequently, the report estimates a US shortfall, for business translators, of between 2 million and 4 million by 2026.
Currently, about 10% of US business and science, technology, engineering, and mathematics (STEM) graduates enter business translator roles. However, given the current production of graduates, this number will need to more than double to meet demand. Consequently, many organizations have initiated in-house training programs to fill business translator positions.
The conversion of STEM and business graduates to the role of Business Translator represents a significant opportunity for OC. The proposed PDBMDA addresses this opportunity in two ways. Business graduates can gain technical expertise while STEM graduates can learn how to apply extant technical expertise in the area of Marketing.
A Google search (on July 28, 2017) for the phrase "data science" returned a staggering 23.8 million results. The results point to sites for courses and programs, professional sites, blogs, job opportunities, etc. The investigation is also complicated by the existence of numerous data-driven disciplines: business analytics, data analytics, data analysis, healthcare analytics, etc. For instance, despite comparable skills, a data scientist at one company might be labelled a business analyst at another company.
A search (on August 17, 2017) for the phrase "data scientist", on the job site Indeed, produced 188 postings for Canadian jobs. A search for "data analyst" produced 371 postings and a search for "business analytics" produce 230 postings. The postings were subsequently partitioned according to the keywords "machine learning" (ML), "mathematics", "statistics", and "Python". The results are summarized in the table below.

Discipline	ML	Mathematics	Statistics	Python
Data Scientist	72%	36%	49%	68%
Data Analyst	6.5%	16%	24%	16%
Business Analytics	5.2%	9.6%	18%	8.8%

Table 1: Canadian Job Postings (Indeed Job Trends)

As we move away from Canadian job postings, the demand for data scientists and data analysts versus time tells a different story. The demand for data scientists appears to be overtaking the demand for data analysts (see Appendix 3 for graph).

A distribution of data scientist salaries is given in a table in the appendix. The average salary is reported as $167K (USD). This average includes annual and signing bonuses as well as equity. Additional and updated information can be found on the Paysa Data Science Salaries.

Marketing & Data Analytics as a High Demand Occupation

Students interested in the PBDMDA are potentially employable in a number of industries including:

· Health Care Authorities
· Digital Marketing Firms
· Marketing Research Firms
· Accounting & Consulting Firms
· Insurance and Actuarial Companies
· Financial Institutions & Banks
· Municipal, Provincial and Federal Governments

Students interested in Marketing and Data Analytics are employable in traditional marketing firm as well as those specializing in social media. The health care, finance, insurance and banking industries, along with the government sector are all areas adopting data analytics as part of their core operations. Some are creating new data analytics departments while others are housing them in their Finance, Research, Human Resources or Marketing departments.

Locally, a number of major employers have an data analytics department including the Interior Health Authority (IHA), Tolko Industries and Kal Tire. Most recently the City of Kelowna has also opened an analytics department. In addition, locally based credit unions including Valley First and Interior Savings also have analytics department and are looking for employees. These employers advise us that it is difficult to recruit employees for these departments and IHA advises they fully support the development of this program at Okanagan College.

Calendar description:

This unique two-year post-baccalaureate diploma (60 credit/20 course) is aimed at students with a bachelor degree in any business or science program who wish to pursue a career in Marketing and Data Analytics. Students will receive thorough training in statistics and data science. Term one of this program sets the mathematical and statistical foundation for higher level learning in the marketing and data science area. In subsequent terms, students build on, and apply, these foundational skills to a diverse set of areas. While many of the applications have a business or marketing focus, the mathematical, statistical, and data science concepts learned are universally applicable to a wide range of disciplines.

Program Learning Outcomes:

At the end of this program students will:

Apply mathematical, statistical and machine learning techniques to support organizational decisions as well as to identify new data driven opportunities.

Manage and manipulate data and create data visualizations using a variety of mathematical and statistical software.

Participate in the planning and execution of a data science project culminating in recommendations based on the results of the analysis.

Evaluate, define and explain data-analytic problems that offer the greatest opportunities for organizational benefits.

Understand digital marketing and the business applications of marketing analytics.

Perform both primary and secondary marketing research, analyze data, and present in a professional format.

Admission requirements:

Successful completion of a recognized Bachelor Degree in any business or science program. A post-secondary basic calculus course, or equivalent, is highly recommended.

Graduation requirements:

Successful completion of the prescribed and elective courses as listed in the program outline with a minimum graduating grade average of 60%.

Addition of courses:

DSCI 100, DSCI 101, DSCI 110, DSCI 200, DSCI 390

Revision of courses:

MATH 147, MATH 251/CSCO 221, MATH 314, STAT 230/BIOL 202, STAT 310

Program outline:

Semester 1:	
DSCI 100	Introduction to Data Science 1
DSCI 110	Mathematical Computation
BUAD 116	Marketing
STAT 230	Elementary Applied Statistics
MATH 314	Calculus and Linear Algebra for Business
Semester 2:	
DSCI 101	Introduction to Data Science 2
BUAD 123	Management Principles
BUAD 200	Digital Marketing
BUAD 210	Introduction to Marketing Research
STAT 240	Applied Statistics II
Semester 3:	
DSCI 200	Introduction to Data Science 3
BUAD 283	Management Information Systems
STAT 310	Regression Analysis
BUAD 344	Marketing Analytics and Data Analysis
Elective	Any 3 credit academic course
Semester 4:	
MATH 251	Introduction to Discrete Structures
STAT 311	Modern Statistical Methods
BUAD 315	Management Science
DSCI 390	Data Science Project
Elective	Any 3 credit academic course

Implementation date: July 2019

Cost: N/A