

Items Approved by Education Council

December 3, 2020

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Trades and Apprenticeship Programs

Culinary Arts Certificate

Program revision:

- Graduation requirements

Rationale:

The changes will align the program with the industry certification standards for this trade (as set by the ITA) and enable the students to achieve graduation with still having to achieve the set benchmark, but being able to make up missing marks in other kitchens, along the way.

Graduation requirements:

Existing	Proposed
Completion of all courses in the program with a minimum grade of 70% in each.	Overall minimum grade of 70% upon completion of the Culinary Arts Certificate, with a minimum of 60% for each course. Students must provide proof of completion of 400 work-based training hours.

Implementation date: January 2021

Cost: N/A

Culinary Management Diploma

Program revision:

- Graduation requirements

Rationale:

The changes will align the program with the industry certification standards for this trade (as set by the ITA) and enable the students to achieve graduation with still having to achieve the industry set benchmark, but being able to make up missing marks in other kitchens, along the way.

Continuing Studies Wine 21 and Wine 31 has historically been a challenge integrating into the Culinary Management diploma, so when significant revisions were made to these courses it provided an opportunity to update the diploma. The priority moving forward is to remove Wine 21 and 31 from the diploma and to be replaced with more business centric courses - in particular TOUR 105 Intro to Tourism and a second business elective.

Graduation requirements:

Existing	Proposed
Students must successfully complete all program components and must provide proof of completion of 400 work-based training hours. Successful completion of Business Administration courses requires a minimum grade of 50% per course and a minimum average grade of 60%. Successful completion of Culinary Arts courses requires a minimum grade of 70% per course and a	Overall minimum grade of 70% upon completion of the Culinary Arts Certificate, with a minimum of 60% for each course. Students must provide proof of completion of 400 work-based training hours. Successful completion of Business Administration courses requires a minimum

minimum average grade of 80%. Successful completion of Wine courses requires a minimum grade of 60%.	grade of 50% per course and a minimum average grade of 60%.
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Implementation date: January 2021

Cost: N/A

Automotive Service Technician, Carpentry/ Joinery, Carpenter Foundation, Collision Repair Technician, Culinary Arts Certificate, Electrical Pre-Apprenticeship, Heavy Mechanical Foundation, Pastry Arts, Refrigeration and A/C Mechanic, RV Technician, Plumbing and Piping Trades, Sheet Metal Worker, Studio Woodworking, Welder Foundation, Aircraft Maintenance Technician (Maintenance), Aircraft Maintenance Engineer (Structure), Automotive Service Technology, Collision Repair Technician

Program revision:

- Admission requirements

Rationale:

Omnibus motion to replace current ABLE entrance test with the Trades Entrance Assessment (TEA) for Trades certificate and diploma programs.

The Trades Entrance Assessment has been developed in-house to include relevant trades questions which are more inclusive and equitable than the previous ABLE questions. As well, this new entrance test will be offered on-line and will include a pathway to success, with practice tests and suggested study materials.

Admission requirements:

	English ABLE requirement (former)	English TEA requirement (new)	Math ABLE requirement (former)	Math TEA requirement (new)	Number of Math Questions
Foundation Programs					
Automotive Service Technician	77%	77%	63%	63%	38
Carpentry/ Joinery	77%	77%	63%	63%	50
Carpenter Foundation	77%	77%	63%	63%	50
Collision Repair Technician	77%	77%	50%	50%	38
Culinary Arts Certificate	77%	77%	50%	50%	19
Electrical Pre-Apprenticeship	88%	88%	85%	85%	50
Heavy Mechanical Foundation	77%	77%	63%	63%	38
Pastry Arts	77%	77%	50%	50%	19
Refrigeration and A/C Mechanic	77%	77%	50%	50%	50
RV Technician	77%	77%	63%	63%	50
Plumbing and Piping Trades	77%	77%	50%	50%	50
Sheet Metal Worker	77%	77%	50%	50%	38
Studio Woodworking	77%	77%	50%	50%	50
Welder Foundation	77%	77%	63%	63%	38
Diploma Programs					
Aircraft Maintenance Technician (Maintenance)	77%	77%	63%	63%	50
Aircraft Maintenance Engineer (Structures)	83%	83%	63%	63%	50
Automotive Service Technology	77%	77%	63%	63%	38
Collision Repair Technician	77%	77%	50%	50%	38

Implementation date: January 2021

Cost: N/A

Science, Technology, and Health Programs

ICT 212 – 3 – 5.5

Cybersecurity Analysis

New course

Rationale:

Business organizations are redefining their IT security postures away from a secure perimeter model to a much expanded toolbox that allows them to define secure operations end-to-end and to involve their entire workforces in security issues. New frameworks such as the zero-trust model have arisen. These changes to business structure result in changes to job offerings. ICT 212 provides ICT graduates with the opportunity to acquire the knowledge and skills needed to successfully compete for entry level positions in the areas of Security Operations, Cyber Security Analysis, and Information Security.

Calendar description:

This course introduces the student to an analytics-based approach to cybersecurity operations. It teaches core security skills needed for monitoring, detecting, investigating, and responding to security events. Industry-standard technologies, tools, regulations, and frameworks are applied to prepare for, monitor, detect, investigate, analyze and respond to security incidents. Theoretical concepts are practically applied to develop skills for securing and protecting an organization's data, systems, and applications.

Prerequisites:

ICT 127, ICT 137

Course outline:

Course Outline

Professor:

Office Location

Office Phone

Email

Credit Hours 3.0

Presentation format Lecture 3 hrs/wk, Lab 2.5 hrs/wk,

Prerequisite: ICT 127, ICT 137

Co-requisite N/A

Description:

This course introduces the student to an analytics-based approach to cybersecurity operations. It teaches core security skills needed for monitoring, detecting, investigating, and responding to security events. Industry-standard technologies, tools, regulations, and frameworks are applied to prepare for, monitor, detect, investigate, analyze, and respond to security incidents. Theoretical concepts are practically applied to develop skills for securing and protecting an organization's data, systems, and applications.

Major Topics:

1. *Security Concepts*
2. *Security Monitoring*
3. *Host-based Analysis*
4. *Network Intrusion Analysis*
5. *Security Policies and Procedures*

Course Evaluation

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

Assignments	15%
Lab Submissions	15%
Midterm Exam	30%

Assignments will consist of study guide and online assessment tasks based on the assigned reading.

Lab Submissions will be questions answered or results submitted as a result of completing lab work.

The Midterm and Final Exams will contain both theoretical and practical portions. These will be completed separately.

Course Materials:

CyberOps Associate Curriculum with Cisco Networking Academy Online

Learning Outcomes:

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

Topic	Objectives
<p>Security Concepts Principal characteristics of threats, vulnerabilities, and the strategies to minimize the impact of a breach</p>	Describe the CIA triad
	Communicate the characteristics and severity of a vulnerability using industry standard CVSS
	Compare security deployments
	Identify the challenges of data visibility
	Describe and implement identity and access control mechanisms
	Explain the importance of Personally Identifiable Information (PII) and Protected Health Information (PHI)
<p>Security Monitoring Attack surfaces and data visibility</p>	Implement secure log collection, storage, analysis, and disposal
	Recognize common operational challenges to security monitoring including: <ul style="list-style-type: none"> • Encryption • NAT • DNS tunneling • Tor • peer-to-peer communication
	Describe the types, common examples, and potential mitigations of cyber attacks including: <ul style="list-style-type: none"> • Reconnaissance • Social Engineering • Privilege Escalation • Backdoors • Code Execution • Man-in-the-Middle • Denial-of-Service • Data exfiltration

	<ul style="list-style-type: none"> • ARP Cache Poisoning • Route Manipulation • Password • Wireless <p>Describe potential weaknesses and vulnerabilities (including countermeasures) in a system or network including:</p> <ul style="list-style-type: none"> • Policy flaws • Design errors • Protocol weaknesses • Misconfiguration • Software vulnerabilities • Human factors • Malicious software • Hardware vulnerabilities • Physical access to network resources 	
<p>Host-based Analysis Gathering and analyzing data from endpoints</p>	<p>Apply methods for the secure handling of assets</p> <p>Understand how end-user systems are architected to handle data and identify potential vulnerabilities</p> <p>Configure and monitor antimalware and antivirus software</p> <p>Configure and monitor host-based firewall and intrusion prevention software</p> <p>Recognize the use-cases for and implement system-based sandboxing</p> <p>Recognize the use-cases for and implement application-level whitelisting and blacklisting</p> <p>Perform host profiling including reporting on:</p> <ul style="list-style-type: none"> • Listening ports • Logged-in Users / Service Accounts • Running processes • Applications <p>Perform basic host-system forensics tasks</p>	
<p>Network Intrusion Analysis Gathering and analyzing data from network devices</p>	<p>Identify the necessary components needed to support accurate network telemetry</p> <p>Perform network profiling including reporting on</p> <ul style="list-style-type: none"> • Throughput (amount and type of traffic) • Physical / logical port status • Network access control (NAC) • Session duration • Critical asset address space <p>Recognize and gather useful metadata from network traffic</p> <p>Describe methods used to evade security including:</p> <ul style="list-style-type: none"> • Encryption and tunneling 	

	<ul style="list-style-type: none"> • Resource exhaustion • Traffic fragmentation • Protocol-level misinterpretation • Traffic substitution and insertion • Pivoting
	Use packet captures for intrusion analysis
	Use Netflow as a tool for anomaly detection
	Use Netflow as a tool for data leak detection and prevention

Security Operations, Policies, and Procedures Models and standards for incident handling	Apply the Identity and Access Lifecycle
	Recognize and document an attack scope
	Prepare an incident response plan including: <ul style="list-style-type: none"> • Preparation phase • Detection and analysis phase • Containment, Eradication, and Recovery phase • Post-Incident Activity
	Given an incident, act as a member of a Computer Security Incident Response Team (CSIRT) in accordance with industry norms
	Explain the significance of compliance frameworks such as the Payment Card Industry Data Security Standard (PCI DSS) or standards regulating PII and PHI.
	Perform basic data and event analysis including normalizing data and mapping threat intelligence with DNS and other artifacts
	Explain a cyber attack using the Diamond Model of Intrusion
	Prepare an attack graph for a cyber incident according to the cyber kill chain model

NTEN DEPARTMENT POLICIES

NTEN Department Passing Grade Requirements Policy

Students must obtain a passing grade (at least 50%) in both the lecture/written 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 49%.**

NTEN 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%.** **Laboratory attendance will be recorded.**

OKANAGAN COLLEGE POLICIES

Okanagan College Academic Integrity Policy:

Okanagan College requires that all students are informed of the Academic Integrity Policy included in the College Calendar which can be found at the following link:

<http://webapps-5.okanagan.bc.ca/ok/Calendar/AcademicIntegrity>

Okanagan College Student Conduct Policies:

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Implementation date: September 2021

Cost: N/A

Infrastructure and Computer Technology Diploma

Program revision:

- **Addition of courses**
- **Resequencing of courses/program outline**

Rationale:

The recent rise in the importance of cyber security to businesses, governments, and organizations has driven a review of market fit for ICT graduates. Current demand emphasizes an awareness of cyber security and this program revision realigns the coursework with the present marketplace.

Addition of courses:

ICT 212

Resequencing of courses/program outline:

Existing	Proposed	
First Year		
Semester One		
ICT 111 Computer Components and Peripherals	ICT 111 Computer Components and Peripherals	
ICT 112 Computer Programming I	ICT 112 Computer Programming I	
ICT 113 Voice and Data Communications Infrastructure	ICT 113 Voice and Data Communications Infrastructure	
ICT 117 Networks and Telecommunications I	ICT 117 Networks and Telecommunications I	
CMNS 113 Technical Communication for Information Technology	CMNS 113 Technical Communication for Information Technology	
MATH 127 Math for Network & Telecom Engineering Tech I	MATH 127 Math for Network & Telecom Engineering Tech I	
Semester Two		
ICT 123 Network Applications of Analog and Digital Systems	ICT 123 Network Applications of Analog and Digital Systems	
ICT 127 Local Area Network Management	ICT 127 Local Area Network Management	
ICT 137 Routing and Switching I	ICT 137 Routing and Switching I	
CMNS 123 Analysis and Reporting for Information Technology	CMNS 123 Analysis and Reporting for Information Technology	

ICT 128 Scripting for Network and System Administrators	ICT 128 Scripting for Network and System Administrators	
One elective (3 credits)	One elective (3 credits)	
Extended Semester (2 weeks)	Extended Semester (2 weeks)	
ICT 199 Topics in Internetworking	ICT 199 Topics in Internetworking	
Second Year		
Semester Three		
ICT 207 Enterprise Telecommunications	ICT 207 Enterprise Telecommunications	
ICT 211 Virtualization for Enterprise System Administrators	ICT 211 Virtualization for Enterprise System Administrators	
	ICT 212 Cybersecurity Analysis	
ICT 217 Routing and Switching II	ICT 217 Routing and Switching II	
ICT 219 Linux Server Management	ICT 219 Linux Server Management	
Two electives (6 credits)	One elective (3 credits)	
Semester Four		
ICT 225 Internetwork Security I	ICT 225 Internetwork Security I	
ICT 227 Carrier Telecommunications		
ICT 223 Internet of Things	ICT 223 Internet of Things	
ICT 299 Network Project	ICT 299 Network Project	
	One elective (3 credits)	

Technical, Business Administration and Communication Electives

9 credits of electives are included in the program.

6 of these credits must be approved Information Technology courses, or Electronics courses, or Computer Science courses eligible for credit towards the Bachelor of Computer Information Systems (BCIS) program, or Math courses eligible for credit towards the BCIS program. COSC 109, COSC 115, COSC 122 and COSC 127 or any course offering similar content to an existing course in the NTEN program are not eligible for credit towards the NTEN diploma. Any student considering a course that may offer similar content should consult with the chair prior to registration.

3 of these credits must be either Business Administration (BUAD) courses eligible for credit towards the Bachelor of Business Administration (BBA) program or Communication (CMNS) courses.

Implementation date: September 2021

Cost: N/A

Okanagan College to UBC Okanagan Civil Engineering Bridge

Program revision:

- Addition of courses
- Removal of courses

Rationale:

UBC Okanagan has requested that we change the Math 212 - Calculus III to Math 221 - Introduction to Linear Algebra in the Okanagan College to UBC Okanagan Civil Engineering Bridge program as noted in the attached email from Yang Chao. This will allow the students to get credit for APSC 179 in the UBC Okanagan Engineering program and better prepare them for studies at UBC Okanagan.

Addition of courses:

MATH 221

Removal of courses:

MATH 212

Implementation date: August 2021

Cost: N/A

Okanagan College to UBC Okanagan Electrical Engineering Bridge

Program revision:

- Addition of courses
- Removal of courses

Rationale:

UBC Okanagan has requested that we change the Math 212 Calculus III to Math 221 Introduction to Linear Algebra. This would better suit the math programs within the UBC Okanagan Civil Engineering program

Addition of courses:

MATH 221

Removal of courses:

MATH 212

Implementation date: August 2021

Cost: N/A

Okanagan College to UBC Okanagan Mechanical Engineering Bridge

Program revision:

- Addition of courses
- Removal of courses

Rationale:

The Mechanical Engineering Bridge students were taking a Calculus III course in the Bridge at OC, then taking a very similar Calculus III course once they got to UBC-O. This change will eliminate repeating Calc III. So, MATH 212 Calculus III is to be removed to avoid duplication at UBC-O.

UBC-O requires a higher level math course in the Bridge and it has been agreed that MATH 221 Introduction to Linear Algebra will be a suitable substitute for MATH 212. This change was initiated by UBC-O, as noted in the attached email from Dr. Yang Cao.

Addition of courses:

MATH 221

Removal of courses:

MATH 212

Implementation date: August 2021

Cost: N/A

DSCI 315 – 3 – 4

Dashboards and Analytic Reporting

New course

Rationale:

This course will be part of the Post baccalaureate Diploma in Health Analytics.

Calendar description:

This course is an introduction to dashboard reporting. Students will learn how to use Power Query to clean, transform and refine data before incorporating it into a data model or dashboard. Learners will also learn how to create scalable models using Power Pivot. Finally, students will build interactive visualizations.

Prerequisites:

Third year standing

Course outline:

Dashboards and Analytic Reporting

Fall 2023

Professor Information

Professor:	Name
Campus:	Campus
Office:	Room
Phone:	Phone No
E-mail:	name@okanagan.bc.ca Office
Hours:	Hours

Section Information

Section: 001
Class Times:

Calendar Description

DSCI 315-3-4

Dashboards and Analytic Reporting with Power BI

This course is an introduction to dashboard reporting. Students will learn how to use Power Query to clean, transform and refine data before incorporating it into a data model or dashboard. Learners will also learn how to create scalable models using Power Pivot. Finally, students will build interactive visualizations. (4,0,0)

Prerequisites:

- Third year standing

Transfer Information

Please refer to the transfer guide, available online at <http://www.bctransferguide.ca>. Students are encouraged to save a copy of current transfer information for their own records.

Course Evaluation

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

Assignments	25%
Tests	35%
Final Exam	40%
Total	100%

- **Assignments:** Assignments will be distributed on a biweekly basis.
- **Tests:** Tests will be announced in advance during class.
- **Final Exam:** The final exam will be cumulative and held at a time and place set by the college. The final exam schedule is generally made available approximately half way through the semester.

Learning Outcomes

Upon successful completion of the course, students will be able to:

1. Learn how to use Power Pivot, Power BI and Power Query.
2. Be confident using relational databases, star schemas and hierarchies.
3. Use DAX for time period-based evaluations.
4. Create visualizations using Power BI.
5. Create dashboards to communicate results.

Course Materials

The required text for this course is:

Clark, **Beginning Power BI, 2nd edition**
Apress, 2017, ISBN: #9781484225776

Course Content

In order to achieve the learning outcomes for this course, learners are expected to have a strong knowledge of the content from the chapters indicated below. To ensure their own success, students are expected to read and complete practice problems from the textbook chapters listed below:

Part 1: Building Models in Power Pivot

- 2 Importing data into power pivot
- 3 Data munging with power query
- 4 Creating the data model
- 5 Creating calculations with DAX
- 6 Creating measures with DAX
- 7 Incorporating time intelligence
- 8 Data analysis with pivot tables and charts

Part 2: Building Interactive Reports and Dashboards with Power BI Desktop

- 9 Introducing Power BI desktop
- 10 Creating reports with Power BI desktop
- 11 Publishing reports and creating dashboards in the Power BI portal
- 12 Creating a complete solution
- 13 Advanced topics in power query
- 14 Advanced topics in Power BI

OkanaganCollegePolicies

Final Exam Policy: The procedures relating to final exams are significantly different than those that involve midterms. Final exam policy is determined by the college and a much more formal process is invoked should a student be unable to write the final exam. It is stated in the final exam policy that student travel plans are not a valid reason for writing an out-of-time final exam. As such, it is essential that you do not make travel plans prior to the final exam schedule being posted. The full final exam policy can be found at the following link.

[http://webapps-](http://webapps-5.okanagan.bc.ca/ok/Calendar/Examinations)

[5.okanagan.bc.ca/ok/Calendar/Examinations](http://webapps-5.okanagan.bc.ca/ok/Calendar/Examinations)

The final exam schedule is determined by the Office of the Registrar and posted at the following link sometime around the middle of the semester.

<https://www.okanagan.bc.ca/office-of-the-registrar/scheduling-office/scheduling-office#finalexam>

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StudentAdvising&Counselling

Accessibility Services, located in the Student Services Building, collaborates with the academic departments of the college to arrange appropriate accomodation for students with a disability. If you require academic accomodation, please contact disability services. Contact, and other relevant information, can be found at:

<https://www.okanagan.bc.ca/accessibility-services>

Counselling Services, also located in the Student Services Building, has professionally trained staff that are available to assist students in coping with problem areas in their life (including: personal & career counselling, study skills) that interfere with maximizing their academic and social potential. For more information visit:

<http://www.okanagan.bc.ca/counselling-services>

Implementation date: September 2021

Cost: N/A

New course

Rationale:

This course will be part of the Post baccalaureate Diploma in Health Analytics.

Calendar description:

Data analytics plays an increasingly greater role in health care organizations. This course provides a background to how analytics is used in the healthcare industry. Students will work hands-on with healthcare data to transform it into value through predictive analytics. This course provides learners a sense of how analytics is used in a broad range of roles (both clinical and non-clinical), and how to effectively gather and communicate information from data analytics. The goal of this course is to help students understand how analytics can be used to improve clinical outcomes and reduce healthcare costs.

Prerequisites:

Third year standing.

Course outline:

Dsci 321

Health Care Analytics

Winter 2022

Professor Information

Professor: Name
Campus: Campus
Office: Room
Phone: Phone No
E-mail: name@okanagan.bc.ca Office
Hours: Hours

Section Information

Section: 001
Class Times:

Calendar Description

DSCI 321-3-4

Health Care Analytics

Data analytics plays an increasingly greater role in health care organizations. This course provides a background to how analytics is used in the healthcare industry. Students will work hands-on with healthcare data to transform it into value through predictive analytics. This course provides learners a sense of how analytics is used in a broad range of roles (both clinical and non-clinical), and how to effectively gather and communicate information from data analytics. Students will use analytics to improve clinical outcomes and reduce healthcare costs. (4,0,0)

Prerequisites:

- Third year standing

Transfer Information

Please refer to the transfer guide, available online at <http://www.bctransferguide.ca>. Students are encouraged to save a copy of current transfer information for their own records.

Learning Outcomes

Upon successful completion of the course, students will be able to:

1. Appreciate the role of analytics in healthcare.
2. Discuss payer, patient and provider analytics.

3. Discuss the value of healthcare analytics.
4. Discuss the key performance indicators in healthcare.
5. Discuss the issues around security in healthcare data.
6. Discuss the role of ethics and regulatory bodies with respect to healthcare data.
7. Discuss the best practices in healthcare analytics.

Course Materials

The required text for this course is:

McNeill, **Analytics in Healthcare and the Life Sciences**
 Pearson, 2013, ISBN: #10: 0-13-340733-0

Course Content

In order to achieve the learning outcomes for this course, learners are expected to have a strong knowledge of the content from the textbook chapters indicated below. To ensure their own success, students are expected to read and complete practice problems from the textbook chapters listed below:

Part 1: An Overview of Analytics in Healthcare and Life Sciences

- 1 An overview of provider, payer and life sciences analytics
- 2 An overview of analytics in healthcare providers
- 3 An overview of analytics in healthcare payers
- 4 Surveying the analytical landscape in life sciences organizations

Part 2: Strategies, Frameworks, and Challenges for Health Analytics

- 5 Grasping the brass ring to improve healthcare through analytics: The fundamentals
- 6 A taxonomy for healthcare analytics
- 7 Analytics cheat sheet
- 8 Business value of health analytics
- 9 Security, privacy, and risk analytics in healthcare
- 10 The birds and the bees of analytics: The benefits of cross-pollination across industries

Part 3: Healthcare Analytics Implementation Methods

- 11 Grasping the brass ring to improve healthcare through analytics: Implementation methods
- 12 Meaningful use and the roll of analytics: Complying with regulatory imperatives
- 13 Advancing health provider clinical quality analytics
- 14 Improving patient safety using clinical analytics
- 15 Using advanced analytics to take action for health plan members' health
- 16 Measuring the impact of social media in healthcare

Part 4: Best Practices in Healthcare Analytics Across the Ecosystem

- 17 Overview of healthcare analytics best practices across the ecosystem
- 18 Partners healthcare system (time permitting)

Course Evaluation

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

Assignments	20%
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Implementation date: September 2021

Cost: N/A

DSCI 322 – 3 – 4

New course

Rationale:

This course will be part of the Post baccalaureate Diploma in Health Analytics.

Calendar description:

A fundamental step in improving the quality of health globally is having a clear understanding of health systems globally. This course explores health systems across a variety of countries comparing them to the Canadian system, the US system and the European system. A thorough frame work of a variety of countries' history, geography,

Comparative Health Systems

government, and economy will be examined to compare the healthcare systems so learners can gain insight into how data and data science can be best used to improve health related outcomes, facilities, workforce, technology, cost, quality, and access. Data privacy across countries is also examined.

Prerequisites:

Third year standing.

Course outline:

DSCI322

Comparative Health Systems

Fall2022

Professor Information

Professor: Name
Campus: Campus
Office: Room
Phone: Phone No
E-mail: name@okanagan.bc.ca Office
Hours: Hours

Section Information

Section: 001
Class Times:

Calendar Description

DSCI 322-3-4

Comparative Health Systems

A fundamental step in improving the quality of health globally is having a clear understanding of health systems globally. This course explores health systems across a variety of countries comparing them to the Canadian system, the US system and the European system. A thorough frame work of a variety of country’s history, geography, government, and economy will be examined to compare the healthcare systems so learners can gain insight into how data and data science can be best used to improve health related outcomes, facilities, workforce, technology, cost, quality, and access. Data privacy across countries is also examined. (4,0,0)

Prerequisites:

- Third year standing

Transfer Information

Please refer to the transfer guide, available online at <http://www.bctransferguide.ca>. Students are encouraged to save a copy of current transfer information for their own records.

Course Evaluation

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

Project & Presentation	40%
Tests	60%
Total	100%

- **Project and Presentation:** A major research project including a presentation will be required for this course.
- **Tests:** Tests will be announced in advance during class.

Learning Outcomes

Upon successful completion of the course, students will be able to:

1. Discuss the Canadian healthcare system.
2. Compare the Canadian healthcare system with healthcare systems in other countries.
3. Discuss the role of government, economic systems, and other factors play in healthcare in various countries.

4. Compare the history of healthcare in a variety of countries.
5. Discuss how various legislation (especially data privacy policies) play a roll in healthcare.

CourseMaterials

The required text for this course is:

Johnson, Stoskopf, **Comparative Health Systems: Global Perspectives**
Jones and Bartlett learning, 2011, ISBN: #10: 1449625614

CourseContent

In order to achieve the learning outcomes for this course, learners are expected to have a strong knowledge of the content from the textbook chapters indicated below. To ensure their own success, students are expected to read and complete practice problems from the textbook chapters listed below:

Part 1: Global Health and Health Systems

- 1 Introduction to health systems
- 2 Global health and disease
- 3 Global health: systems, policy and economics

Part 2: Health Systems by Country

4 – 21 Learners will be exposed to the health systems in a variety of countries (including Canada) and compare those systems to both the Canadian system, the US system and the European system. Emphasis will be placed not only on health care in North America but also on the European system as they are a global leader in data privacy regulations.

Part 3: Challenges and Opportunities

- 22 The role of nongovernmental organizations in global health
- 23 Comparative global challenges and opportunities

OkanaganCollegePolicies

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[http://webapps-](http://webapps-5.okanagan.bc.ca/ok/Calendar/Examinations)

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<http://www.okanagan.bc.ca/counselling-services>

Implementation date: September 2021

Cost: N/A

DSCI 323 – 3 – 4

Epidemiology and Health Analytics

New course

Rationale:

This course will be part of the Post baccalaureate Diploma in Health Analytics.

Calendar description:

This course aims to answer the question of what is epidemiology and how does it contribute to the health of our society. Topics for this course include the theory and methods of epidemiological research and analysis, causal inference and the role that statistics plays in that research. Learners will become better able to read epidemiological literature and point out statistical flaws and study design flaws. Gaining these types of critical evaluation skills is particularly important for public health practitioners. The course focuses on epidemiological study design as well as the tools needed to interpret the results of studies. Ethical conduct is emphasized through the course.

Prerequisites:

Third year standing.

Course outline:

DSCI 323

Epidemiology and Health Analytics

Winter 2023

Professor Information

Professor:	Name
Campus:	Campus
Office:	Room
Phone:	Phone No
E-mail:	
	name@okanagan.bc.ca Office
Hours:	Hours

Section Information

Section:	001
Class Times:	

Calendar Description

DSCI 323-3-4

Epidemiology and Health Analytics

This course aims to answer the question of what is epidemiology and how does it contribute to the health of our society. Topics for this course include the theory and methods of epidemiological research and analysis, causal inference and the role that statistics plays in that research. Learners will become better able to read epidemiological literature and point out statistical flaws and study design flaws. Gaining these types of critical evaluation skills is

particularly important for public health practitioners. The course focuses on epidemiological study design as well as the tools needed to interpret the results of studies. Ethical conduct is emphasized through the course. (4,0,0)

Prerequisites:

- Third year standing

Transfer Information

Please refer to the transfer guide, available online at <http://www.bctransferguide.ca>. Students are encouraged to save a copy of current transfer information for their own records.

Course Evaluation

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

Assignments	15%
Tests	45%
Final Exam	40%
Total	100%

- **Assignments:** Assignments will be distributed on a biweekly basis.
- **Tests:** Tests will be announced in advance during class.
- **Final Exam:** The final exam will be cumulative and held at a time and place set by the College. The final exam schedule is generally made available approximately half way through the semester.

Learning Outcomes

Upon successful completion of the course, students will be able to:

1. Define and discuss the goals of public health.
2. Discuss how epidemiology (and data related to epidemiology) contributes to the health of our society.
3. Discuss how data and statistics plays a role in epidemiological research.
4. Discuss epidemiological study design.
5. Develop the tools needed to interpret study results.
6. Discuss the role of ethics in epidemiology.

Course Materials

The required text for this course is:

Aschengrau, Seage, **Essentials of Epidemiology in Public Health**
Jones and Bartlett Learning, 2020, ISBN: #2018023772

Course Content

In order to achieve the learning outcomes for this course, learners are expected to have a strong knowledge of the content from the chapters indicated below. To ensure their own success, students are expected to read and complete practice problems from the textbook chapters listed below:

Essentials of Epidemiology in Public Health

- | | |
|---------|---|
| 1 | The approach and evolution of epidemiology |
| 2 – 3 | Measures of (and comparing) disease frequency |
| 4 | Sources of public health data |
| 5 | Descriptive epidemiology |
| 6 – 9 | Overview of epidemiological study designs and types of studies |
| 10 – 13 | Bias, confounding, random error, effect measure modification and a critical review of epi- demiological studies |
| 15 | The epidemiological approach to causation |
| 16 | Screening in public health practice (time permitting) |

OkanaganCollegePolicies

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<http://www.okanagan.bc.ca/counselling-services>

Implementation date: September 2021

Cost: N/A

DSCI 324 – 3 – 4

Health Care Information Systems

New course

Rationale:

This course will be part of the Post baccalaureate Diploma in Health Analytics.

Calendar description:

This course offers the fundamental tools and knowledge to manage information and information resources effectively within health care organizations. It reviews the forces that shape the health information landscape, offers guidance on the implementation, evaluation, and management of health care information systems, and reviews laws, regulations, and standards that impact health care information systems.

Prerequisites:

Third year standing.

Course outline:

**DSCI 324
Health Care Information Systems
Winter 2023**

Professor Information

Professor: Name
Campus: Campus
Office: Room
Phone: Phone No
E-mail:
name@okanagan.bc.ca Office
Hours: Hours

Section Information

Section: 001
Class Times:

Calendar Description

**DSCI 324-3-4
Health Care Information Systems**

This course offers the fundamental tools and knowledge to manage information and information resources effectively within health care organizations. It reviews the forces that shape the health information landscape, offers guidance on the implementation, evaluation, and management of health care information systems, and reviews laws, regulations, and standards that impact health care information systems. (4,0,0)

Prerequisites:

- Third year standing

Transfer Information

Please refer to the transfer guide, available online at <http://www.bctransferguide.ca>. Students are encouraged to save a copy of current transfer information for their own records.

Course Evaluation

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

Assignments	20%
Tests	40%
Final Exam	40%
Total	100%

- **Assignments:** Assignments will be distributed on a biweekly basis.
- **Tests:** Tests will be announced in advance during class.
- **Final Exam:** The final exam be cumulative and held at a time and place set by the college. The final exam schedule is generally made available approximately half way through the semester.

Learning Outcomes

Upon successful completion of the course, students will be able to:

1. Discuss strategies for acquiring and implementing health information systems.
2. Discuss methods for assessing the value of a system.
3. Discuss the role of information systems in managing in population health.
4. Discuss health care regulations, laws, and standards.
5. Discuss the role of security in health care information systems.

Course Materials

The required text for this course is:

Wager, Lee, Glaser, **Health Care Information Systems: A Practical Approach for Health Care Management, 4th Edition**
Wiley, 2017, ISBN: #10: 0470387807

CourseContent

In order to achieve the learning outcomes for this course, learners are expected to have a strong knowledge of the content from the textbook chapters indicated below. To ensure their own success, students are expected to read and complete practice problems from the textbook chapters listed below:

Part 1: The Health Care Landscape

- 1 Health Information Technology
- 2 – 4 Health Care Data and Information Systems

Part 2: Implementation, Evaluation and Management

- 4 – 8 Selecting, Implementing, Assessing and Supporting an Information System

Part 3: Laws, Regulations and Standards

- 9 – 11 Privacy, Security, Performance Standards and Health Care Information Systems Standards

Part 4: Senior Management Challenges

- 12 – 14 Strategic Planning and Management

OkanaganCollegePolicies

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Implementation date: September 2021
Cost: N/A

New course

Rationale:

This course will be part of the Post baccalaureate Diploma in Health Analytics.

Calendar description:

This course provides learners with the mathematics behind the four pillars of machine learning: regression, dimensionality reduction, density estimation and classification. While these algorithms will be discussed, the main goal of the course is to equip learners with the mathematical skills necessary to understand future algorithms in data science as the industry is ever-changing.

Prerequisites:

MATH 314 and one of the following Stat classes: STAT 121 (minimum 70%), STAT 124 (minimum 70%) or STAT 230.

Course outline:

**DSCI 420
Mathematics for Machine Learning
Winter 2023**

Professor Information

Professor: Name
 Campus: Campus
 Office: Room
 Phone: Phone No
 E-mail:
name@okanagan.bc.ca Office
 Hours: Hours

Section Information

Section: 001
 Class Times:

Calendar Description

**DSCI 420-3-4
Mathematics for Machine Learning**

This course provides learners with the mathematics behind the four pillars of machine learning: regression, dimensionality reduction, density estimation and classification. While these algorithms will be discussed, the main goal of the course is to equip learners with the mathematical skills necessary to understand future algorithms in data science as the industry is ever-changing. (4,0,0)

Prerequisites:

- MATH 314 and one of STAT 121 (minimum 70%), STAT 124 (minimum 70%) or STAT 230

Transfer Information

Please refer to the transfer guide, available online at <http://www.bctransferguide.ca>. Students are encouraged to save a copy of current transfer information for their own records.

Course Evaluation

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

Assignments	30%
Tests	35%
Final Exam	35%
Total	100%

- **Assignments:** Assignments will be distributed on a biweekly basis.

- **Tests:** Tests will be announced in advance during class.
- **Final Exam:** The final exam be cumulative and held at a time and place set by the college. The final exam schedule is generally made available approximately half way through the semester.

Course Materials

The required text for this course is:

Deisenroth, Faisal, Ong, **Mathematics for Machine Learning**
Cambridge University Press, 2020, Available on github: <https://mml-book.github.io/book/mml-book.pdf>

Course Content

In order to achieve the learning outcomes for this course, learners are expected to have a strong knowledge of the content from the textbook chapters indicated below. To ensure their own success, students are expected to read and complete practice problems from the textbook chapters listed below:

Part 1: Mathematical Foundations

2 – 7 Linear Algebra, Analytic Geometry, Vector Calculus, Probability and Continuous Optimization

Part 2: Central Machine Learning Problems

8 When Models Meet Data
9 Linear Regression
10 Dimensionality Reduction with PCA
11 Density Estimation with Gaussian Mixture Models
12 Classification with Support Vector Machines

Learning Outcomes

Upon successful completion of the course, students will be able to:

1. Apply topics in probability, linear algebra, vector calculus and continuous optimization to solve linear regression problems.
2. Apply topics in probability, linear algebra, analytic geometry and continuous optimization to solve dimensionality reduction problems.
3. Apply topics in probability, vector calculus and continuous optimization to solve density estimation problems.
4. Apply topics in analytic geometry and continuous optimization to solve classification problems.

Okanagan College Policies

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Implementation date: September 2021

Cost: N/A

Post – Baccalaureate Diploma in Health Analytics

New program

Rationale:

Target Student

The PBHA is a program designed for individuals who have completed a bachelor degree (preferably in one of: engineering, science, geography, business, management, nursing, or psychology) and are looking to further their education in data science with a focus in health.

Labor 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 US healthcare system could realize a \$300 billion yearly savings by exploiting data science”. Thus, there appears to be an opportunity for OC to serve our community by training students in the area of Health 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 retailers, using data science, could increase operating margins by more than 60%. It goes on to further state that there is currently a shortage of data scientists (140,000 to 190,000 in 2018) and of those in management who speak the language of data science (1.5 million managers in 2018) and that this shortfall “is becoming a serious constraint in some sectors”.

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 PBHA

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 PBHA program addresses this opportunity in two ways. Nursing and management graduates can gain technical expertise while STEM graduates can learn how to apply extant technical expertise in the area of Health Analytics.

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 labeled 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.

Health Analytics as a High Demand Occupation

Students graduating from the PBHA are potentially employable in a broad range of areas that include:

- Health Care Authorities
- Private Hospitals/Clinics
- Prosthetics Manufacturing Companies
- Medical Forecasting Firms
- Insurance and Actuarial Companies
- Pharmaceutical Companies
- Municipal, Provincial and Federal Governments

Students interested in Health Analytics are employable in a variety of roles within the health care community, both in the public and private sectors. These areas are quickly adopting data analytics as part of their core operations with many opening new analytics departments in their Forecasting, Research, Finance, Human Resources or Marketing areas.

While the applications learned through this PBHA program are aimed at the health sector, the data science skills can be used across any application. Thus, graduates are employable outside the health sector. 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 two-year post-baccalaureate diploma (60 credit/20 course) is aimed at students with a bachelor degree in any nursing, science, engineering, psychology business or management program who wish to pursue a career in Health 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 health and data science areas. In subsequent terms, students build on, and apply, these foundational skills to a diverse set of areas. While many of the applications have a health 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:

1. Apply mathematical, statistical and machine learning techniques to support organizational decisions as well as to identify new data driven opportunities.
2. Manage and manipulate data and create data visualizations using a variety of mathematical and statistical software.
3. Participate in the planning and execution of a data science project culminating in recommendations based on the results of the analysis.
4. Evaluate, define and explain data-analytic problems that offer the greatest opportunities for organizational benefits.
5. Understand healthcare systems in a variety of countries including how their history, geography, government and economy and privacy laws impact the healthcare system.
6. Understand the relevant laws, regulations and standards involved with health data.

Admission requirements:

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

A student who has completed a recognized undergraduate degree in a program different than those listed above may be admitted to the program provided they pass the Okanagan College Basic Algebra Proficiency Test with a minimum score of 20/25 AND the Calculus Readiness Test with a minimum score of 16/25.

Graduation requirements:

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

Program outline:

Semester 1

DSCI 300 DATA WRANGLING AND VISUALIZATION
DSCI 310 MATHEMATICAL COMPUTATION
DSCI 321 HEALTH CARE ANALYTICS
STAT 230 ELEMENTARY APPLIED STATISTICS
MATH 314 CALCULUS AND LINEAR ALGEBRA FOR BUSINESS

Semester 2

DSCI 400 MACHINE LEARNING I
DSCI 322 COMPARATIVE HEALTH SYSTEMS
BUAD 283 MANAGEMENT INFORMATION SYSTEMS
MATH 251 INTRODUCTION TO DISCRETE STRUCTURES
STAT 240 APPLIED STATISTICS II

Semester 3

DSCI 401 MACHINE LEARNING II

DSCI 324 HEALTH CARE INFORMATION SYSTEMS
DSCI 420 MATHEMATICS FOR MACHINE LEARNING
STAT 310 REGRESSION ANALYSIS
ELECTIVE ANY 3 CREDIT ACADEMIC COURSE

Semester 4

DSCI 323 EPIDEMIOLOGY AND HEALTH ANALYTICS
DSCI 315 DASHBOARDS & ANALYTIC REPORTING W/ POWER BI
STAT 311 MODERN STATISTICAL METHODS
DSCI 490 DATA SCIENCE PROJECT
ELECTIVE ANY 3 CREDIT ACADEMIC COURSE

Implementation date: September 2021

Cost: N/A

Schedules

(as approved at the November 20, 2020 Ed Co Operations Committee meeting)

Office Administration Schedule 2021 - 2022

Accounting/Bookkeeping Certificate (20 weeks)

Kelowna

2021

September 6	Labour Day (no classes)
September 7	Orientation
September 8	Classes start
October 11	Thanksgiving Day (no classes)
November 11	Remembrance Day (no classes)
November 12	No classes
December 22	Last day of classes before Christmas break
December 24	College closes at 3 p.m.
December 25 – January 3	Christmas Closure (no classes) – Okanagan College closed to the public

2022

January 4	Classes resume
February 16	Classes end

Administrative Assistant Certificate (37 weeks)

Kelowna, Salmon Arm, Vernon, Penticton

2021

September 6	Labour Day (no classes)
September 7	Orientation
September 8	Classes start
October 11	Thanksgiving Day (no classes)
November 11	Remembrance Day (no classes)
November 12	No classes
December 22	Last day of classes before Christmas break
December 24	College closes at 3 p.m.
December 25 – January 3	Christmas Closure (no classes) – Okanagan College closed to the public

2022

January 4	Classes resume
February 21	Family Day (no classes)
March 28– April 1	Mid-Semester Break (no classes)
April 15 - 18	Easter (no classes)
May 23	Victoria Day (no classes)
June 21	Classes end

Office Assistant Certificate (17 weeks)

Kelowna, Salmon Arm, Vernon, Penticton

2021

September 6	Labour Day (no classes)
September 7	Orientation
September 8	Classes start
October 11	Thanksgiving Day (no classes)
November 11	Remembrance Day (no classes)
November 12	No classes
December 22	Last day of classes before Christmas break
December 24	College closes at 3 p.m.
December 25 – January 3	Christmas Closure (no classes) – Okanagan College closed to the public

2022

January 4	Classes resume
January 19	Classes end

Accounting/Bookkeeping Certificate (20 weeks)

Kelowna

2022

January 20	Classes start
March 28 – April 1	Mid-Semester Break (no classes)
April 15 - 18	Easter (no classes)
May 23	Victoria Day (no classes)
June 27	Classes end

Legal Administrative Assistant Certificate (Litigation - 18 weeks)

Kelowna only

2021

September 6	Labour Day (no classes)
September 7	Orientation
September 8	Classes start
October 11	Thanksgiving Day (no classes)
November 11	Remembrance Day (no classes)
November 12	No classes
December 22	Last day of classes before Christmas break
December 24	College closes at 3 p.m.
December 25 – January 3	Christmas Closure (no classes) – Okanagan College closed to the public

2022

January 4	Classes resume
January 25	Classes end

Legal Administrative Assistant Certificate (Corporate/Conveyancing 19 weeks)

Kelowna only

2022

January 28	Classes start
February 21	Family Day (no classes)
April 15 - 18	Easter (no classes)
May 23	Victoria Day (no classes)
June 20	Classes end

Health Care Assistant Certificate

Fall 2021 Kelowna

August 23	Classes start
September 6	Labour Day (no classes)
October 11	Thanksgiving Day (no classes)
November 11	Remembrance Day (no classes)
December 13	Classes end
December 24	College closes at 3 p.m.
December 25 – January 3	Christmas closure (no classes) – Okanagan College closed to the public

2022

January 1	New Year's Day (no classes)
January 4	Classes start
February 21	Family Day (no classes)
February 24	Classes end

Fall 2021 Penticton, Vernon

October 18	Classes start
November 11	Remembrance Day (no classes)
December 23	Classes end
December 24	College closes at 3 p.m.
December 25 – January 3	Christmas closure (no classes) – Okanagan College closed to the public

2022

January 1	New Year's Day (no classes)
January 4	Classes start
February 21	Family Day (no classes)
April 15 – 18	Easter (no classes or exams)
April 21	Classes end

Winter 2022 Kelowna

January 1	New Year's Day (no classes)
January 4	Classes start
February 21	Family Day (no classes)
April 15 - 18	Easter (no classes or exams)
May 23	Victoria Day (no classes)
June 30	Classes end

Summer 2022 (Kelowna and Salmon Arm)

April 25	Classes start
May 23	Victoria Day (no classes)
July 1	Canada Day
August 1	BC Day (no classes)
September 5	Labour Day (no classes)
October 10	Thanksgiving Day (no classes)
October 20	Classes end