Course Outline

School:	Eng. Tech. & Applied Science
Department:	Information and Communication Engineering Technology (ICET)
Course Title:	Data Warehousing and Data Mining in HCIS
Course Code:	COMP 309
Course Hours/Credits:	56
Prerequisites:	COMP 214
Co-requisites:	N/A
Eligible for Prior Learning, Assessment and Recognition:	Yes
Originated by:	Ilia Nika
Creation Date:	Fall 2009
Revised by:	Mohamed Khan, Mayy Habayeb
Revision Date:	Summer 2017
Current Semester:	Fall 2017
Approved by:	ppesikan c/o

Chairperson/Dean

Students are expected to review and understand all areas of the course outline.

Retain this course outline for future transfer credit applications. A fee may be charged for additional copies.

This course outline is available in alternative formats upon request.

Course Description

Businesses face a number of problems when attempting to analyze their data. Data warehousing techniques allow organizations to extract data from disparate data sources and transform it into actionable information. Data warehousing is an important foundation for business intelligence (BI). By building on the previous database and programming courses, this course covers basic data warehousing and data mining concepts and tools that can be used to create and manage data warehousing and data mining systems. Coursework will emphasize the use of data warehousing and data mining techniques in health care information systems.

Program Outcomes

Successful completion of this and other courses in the program culminates in the achievement of the Vocational Learning Outcomes (program outcomes) set by the Ministry of Advanced Education and Skills Development in the Program Standard. The VLOs express the learning a student must reliably demonstrate before graduation. To ensure a meaningful learning experience and to better understand how this course and program prepare graduates for success, students are encouraged to review the Program Standard by visiting http://www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/. For apprenticeship-based programs, visit http://www.collegeoftrades.ca/training-standards.

Course Learning Outcomes

The student will reliably demonstrate the ability to:

1. Explain the fundamental concepts of Data Warehousing.
2. Explain and describe conceptual, logical, and physical design of Data Warehouses.
3. Build and maintain data warehouses using MS-SQL Server 2014.
4. Explain and describe online analytical processing (OLAP) and OLAP cubes.
5. Design, create, and manage multidimensional structures that contain detail and aggregated data from multiple data sources using Analysis Services 2014 in Microsoft Business Intelligence Tools.
6. Explain and describe data mining building blocks and concepts
7. Design create and manage data mining projects using Microsoft BI tools.
8. Explain how to implement Data Mining with Microsoft Integration Services
9. Apply OLAP in memory engine for tables and develop a tabular project

Essential Employability Skills (EES)

The student will reliably demonstrate the ability to*:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
4. Apply a systematic approach to solve problems.
5. Use a variety of thinking skills to anticipate and solve problems.
6. Locate, select, organize, and document information using appropriate technology and information systems.
7. Analyze, evaluate, and apply relevant information from a variety of sources.
8. Show respect for diverse opinions, values belief systems, and contributions of others.
9. Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.

10. Manage the use of time and other resources to complete projects.
11. Take responsibility for one's own actions, decisions, and consequences.

**There are 11 Essential Employability Skills outcomes as per the Ministry Program Standard. Of these 11 outcomes, the above will be assessed in this course.*

Global Citizenship and Equity (GC&E) Outcomes

The student will reliably demonstrate the ability to*:

1. Identify one's roles and responsibilities as a global citizen in personal and professional life.
4. Analyze the use of the world's resources to achieve sustainability and equitable distribution at the personal, professional, and global level.

**There are 6 institutional Global Citizenship & Equity outcomes. Of these 6 outcomes, the above will be assessed in this course.*

Methods of Instruction

Lecture & Lab

Text and other Instructional/Learning Materials

Text Book(s):

Required:

ISBN-13: 978-1849688888

Available on SafariBooks on-line.

Microsoft SQL Server 2014 Business Intelligence Development Beginner's Guide

Online Resource(s):

Microsoft BI Tutorials & Exercises for SQL Server 2014

https://msdn.microsoft.com/en-us/library/hh231701(v=sql.110).aspx

Material(s) required for completing this course:

Textbook Plus Microsoft Tutorials

Classroom and Equipment Requirements

Overhead for instructor & Lab computers for students

Evaluation Scheme

- Test # 1: Worth 25% course grade
- Test # 2: Worth 25% of course grade
- Term Assignments: There will 4 Term Assignments each worth 10 Marks
- Quizzes: There will be two quizzes each worth 5%.

Evaluation Name	CLO(s)	EES Outcome(s)	GCE Outcome(s)	Weight/100
Test # 1	1, 2, 3, 9	1, 2, 5, 6, 7, 8, 9, 10, 11	1	25
Test # 2	4, 5, 6, 7, 8	1, 2, 4, 5, 6	1, 4	25
Term Assignments	1, 2, 3, 4, 5, 6, 7, 8		1, 4	40
Quizzes	1, 2, 3, 4, 5, 6	1, 2, 4, 5, 6	1, 4	10
Total				100%

If students are unable to write a test they should immediately contact their professor or program Chair for advice. In exceptional and well documented circumstances (e.g. unforeseen family problems, serious illness, or death of a close family member), students may be able to write a make-up test.

All submitted work may be reviewed for authenticity and originality utilizing Turnitin®. Students who do not wish to have their work submitted to Turnitin® must, by the end of the second week of class, communicate this in writing to the instructor and make mutually agreeable alternate arrangements.

When writing tests, students must be able to produce official College photo identification or they may be refused the right to take the test or test results will be void.

Student Accommodation

Students with permanent or temporary accommodations who require academic accommodations are encouraged to register with the Centre for Students with Disabilities (CSD) located at Ashtonbee (L1-04), Progress (C1-03), Morningside (Rm 190), and Story Arts Campus (Rm 284). Documentation outlining the functional limitations of a disability is required; however, interim accommodations pending receipt of documentation may be possible. This service is free and confidential. For more information, please email csd@centennialcollege.ca.

Use of Dictionaries

- Any dictionary (hard copy or electronic) may be used in regular class work.
- Dictionaries may be used in tests and examinations, or in portions of tests and examinations, as long as they are non-electronic (not capable of storing information) and hard copy (reviewed by the invigilator to ensure notes are not incorporated that would affect test or examination integrity).

Program or School Policies

N/A

Course Policies

N/A

College Policies

Students should familiarize themselves with all College Policies that cover academic matters and student conduct.

All students and employees have the right to study and work in an environment that is free from discrimination and harassment and promotes respect and equity. Centennial policies ensure all incidents of harassment, discrimination, bullying and violence will be addressed and responded to accordingly.

Academic honesty is integral to the learning process and a necessary ingredient of academic integrity. Academic dishonesty includes cheating, plagiarism, and impersonation. All of these occur when the work of others is presented by a student as their own and/or without citing sources of information. Breaches of academic honesty may result in a failing grade on the assignment/course, suspension or expulsion from the college.

For more information on these and other policies, please visit www.centennialcollege.ca/about-centennial/college-overview/college-policies.

Students enrolled in a joint or collaborative program are subject to the partner institution's academic policies.

PLAR Process

This course is eligible for Prior Learning Assessment and Recognition (PLAR). PLAR is a process by which course credit may be granted for past learning acquired through work or other life experiences. The PLAR process involves completing an assessment (portfolio, test, assignment, etc.) that reliably demonstrates achievement of the course learning outcomes. Contact the academic school to obtain information on the PLAR process and the required assessment.

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Topical Outline (subject to change):

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
1	Course Overview Introduction to data warehousing	Chapter 1 Supplementary Reading	Explain the basic concepts and importance of data warehousing Differentiate transactional database and data warehousing Explain the importance of integration across the organization through Data.Discuss Data Warehousing Design.	Lecture & Lab	N/A	N/A
2	OLAP Multidimensional	Chapter 2 supplementary Materials	Explain and discuss the concepts of OLAP, dimensions,axes, stars, and snowflakes. Design and build your first cube	Lecture & Lab	Term Assignment 1 Defined	N/A
3	OLAP Tabular	Chapters 3	Learn OLAP In-memory engine concepts. Develop a tabular project.	Lecture & lab	Term Assignment work in progress	N/A
4	Advanced OLAP	Chapter 3 Supplementary Materials	Discuss Key performance indicators (KPIs). Explain the main differences between Multidimensional and Tabular OLAP. Key Performance	Lecture and Lab	Term Assignment 1 is due Quiz #1	Week 4
5	ETL and integration services	Chapter 4	Understand, explain and discuss ETL Create the first SSIS project.	Lecture and Lab	Term Assignment # 1 Feedback Term Assignment # 2 defined	N/A
6	Reporting services	Chapter 9	Discuss Microsoft reporting services architecture. Create reports using Microsoft SSRS.	Lecture & Lab	Term Assignment # 2 in Progress	N/A
7	Review and Test # 1 worth 30 marks	Chapters 1,2,3,4,9	Review and test # 1	Test # 1	Test # 1	Week 7
8	Data quality and data cleansing	Chapter 6 & Microsoft tutorials	Understand data quality services in Microsoft SQL server. Install Data quality services (DSQ). Perform a data quality exercise on sample data.	Lecture & Lab	Term Assignment # 2 worth 10 marks due	Week 8
9	Introduction to Data Mining	Chapter 7 & Microsoft tutorials	Explain and discuss the concepts of data-mining. Explain and discuss the concepts of training versus testing data-sets.Explain and	Lecture & Lab	Term Assignment # 3 defined	N/A

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
			discuss descriptive models in SSAS. Create a descriptive data-mining solution using the Microsoft decision tree algorithm.			
10	Introduction to Data Mining	Chapter 7 plus Microsoft tutorials	Create a descriptive data mining solution using Microsoft association rules.	Lecture & Lab	Term Assignment # 3 in progress	N/A
11	Predictive models in SQL Server Analytics Services (SSAS)	Chapter 8	Explain and discuss predictive models and their business values to organizations.Identify data patterns using predictive models in (SSAS).	Lecture and Lab	Term Assignment # 3 due Term Assignment # 4 defined. Quiz # 2	Week 11
12	Predictive models in SQL Server Analytics Services (SSAS)	Chapter 8	Understand DMX concepts. Apply DMX to a data mining model.	Lecture and Lab	Term Assignment # 4 in Progress	N/A
13	Predictive models in SQL Server Analytics Services (SSAS)	Chapter 8	Explain and discuss the concept of time series mining models. Perform a project to predict future sales using Microsoft time series.	Lecture and Lab	Term Assignment # 4 in progress	N/A
14	Test # 2 worth 30 marks & Final Term Assignment # 4	Chapters 6,7,8 Plus Microsoft Tutorials	Test # 2	Test # 2	Test # 2 & Final Assignment due	Week 14