Bow Valley College

Course Outline

DATA2201

Relational Databases
Fall 2020 - Current

Last Updated: 8/20/2020 5:00:42 PM

DATA2201 Relational Databases

COURSE DESCRIPTION

In this course learners use Structured Query Language (SQL) on commercial relational databases. Using SQL and SQL procedural language, learners create and manage a relational database, addressing data integrity and security. In addition, learners explore the relationship between database administration and software development.

REQUISITES	Complete the following courses: • DATA1201 - Introduction to Relational Databases (3)
EQUIVALENTS	None
CREDITS	3
HOURS	45
ELIGIBLE FOR PLAR	No
ZERO TEXTBOOK COST	No

COURSE LEARNING OUTCOMES

Bow Valley College is committed to ensuring our graduates can demonstrate their abilities in key areas that will make them effective citizens and encourage their development as lifelong learners. In addition to the discipline-specific skills that learners acquire in their programs, the College has identified ten learning outcomes.

College-Wide Outcomes:

1. Communication
2. Thinking Skills
3. Numeracy and Financial Literacy
4. Working with Others
5. Digital Literacy
6. Positive Attitudes and Behaviours
7. Continuous Learning
8. Health and Wellness Awareness
9. Citizenship and Intercultural Competence
10. Environmental Sustainability

#	COURSE LEARNING OUTCOME(S)	COLLEGE WIDE OUTCOMES SUPPORTED
1	Create logical and physical third normal form entity models.	1, 2, 4, 5, 6, 7
2	Define and maintain a database using SQL and a database management system interface.	1, 2, 3, 4, 5, 6, 7
3	Design database objects using SQL procedural language.	1, 2, 3, 4, 5, 6, 7
4	Define and implement constraints to ensure data integrity.	1, 2, 3, 4, 5, 6, 7
5	Identify the role, duties, and responsibilities of a database administrator with respect to the maintenance and security of a database server.	1, 2, 3, 4, 5, 6, 7, 8, 9

COURSE MODULES AND SCHEDULE

**Course schedule subject to change, depending on delivery mode and term of study. For exact dates, please consult the Course Offering Information in Brightspace.*

WEEK/HOURS	MODULES
Week 1	MODULE-01 COURSE ORIENTATION/INTRODUCTION: Syllabus, outline, work ethics, assessments, resources, expectations, workload, instructional methods, course dynamics, D2L, textbook and tools, Q&A
Week 2	MODULE-01 DBMS overview: SQL Overview (DDL, DML, CML), In-class learning activities, Database system development process, Single and Distributed Database System Concepts, People involved with Database systems, Relational DBMS working principle, Relational Database Requirements and ER Modeling
Week 3	MODULE-02 Stored Procedure ,Functions and Trigger: Introduction to stored procedures, Explore built-in stored procedures using SQL server, Creating stored procedures, Create Stored procedure using parameters, Work with return values, Introduction to Functions, Explore built-in Functions, Creating User defined functions, Overview of Trigger
Week 4	MODULE-02 Stored Procedure, Functions and Trigger: Review, Exercises, In-class learning activities
Week 5	MODULE-03 Data integrity and implementation of constraints: Entity Integrity constraint, Referential Integrity constraints, User-defined constraints, Ensuring Database integrity, Data Quality, Core Indexing, Concepts of Indexes, Creating indexes (Heap Clustered Index Covered Index), In-class learning activities
Week 6	MODULE-03 Index and optimization strategies and Database Administration and security: Optimizing Indexes, Introduction to Column, store Index, Database administration overview, Optimizing DB Performance, Ensuring Database integrity, Developing and Optimizing DB Policies and Standards, Monitoring and Maintaining a Database system, In-class learning activities

Week 7	MODULE-04 Database Administration and security: DB Security Issues, Optional Access Control, Mandatory Access Control for Multilevel Security, Types of Database users and Role, Create User and assign privilege using GUI and T-SQL, In-class learning activities
Week 8	MODULE-04 Database Administration and security: Recovery Concepts and techniques, Recovery Concepts Based on Deferred Update, Recovery Concepts Based on Immediate Update, Shadow Paging, The ARIES Recovery Algorithm, Recovery in Multi database Systems, In-class learning activities (ILA6), Create backup file on local computer, Restore database and file on local computer
Week 9	Reading Week
Week 10	MODULE-04 JSON data in SQL Server: Review of JSON data structure, JOSN capabilities of SQL Server/SQL database, Manipulating JSON Data with T-SQL, SQL to JSON data type, Query JSON data in SQL server 2016, JSON path and JSON Auto, EPENJSON, ISJSON, JSON_VALUE, JSON_QUERY, Export JSON from SQL Server, Converting JSON Array of Object to Table, Convert JSON collections to a row set, Learning Activity
Week 11	MODULE-04 Review, Graded Learning Activity
Week 12	MODULE-04 Transaction processing and Concurrency control overview: Transaction and System Concepts, Properties of Transaction, Schedules and Recoverability, Serializability of Schedules, Transaction Support in SQL, Transaction and System Concepts, Properties of Transaction, Schedules and Recoverability, Serializability of Schedules, Transaction Support in SQL
Week 13	MODULE-04 Transaction processing and Concurrency control overview: Locking Techniques for Concurrency Control, Concurrency Control Based ON Timestamp Ordering, Multi version Concurrency Control Techniques, Validation (Optimistic) Concurrency Control Technique, Granularity of Data Items and Multiple Granularity Locking, Using Locks for Concurrency Control in Indexes
Week 14	MODULE-04 Project week: Students are expected to work on their project, Support students on their project
Week 15	MODULE-04 Project Presentation and Wrap Up Class (if there is no overlap with other presentation students might have)

ASSESSMENT

COURSE LEARNING OUTCOME(S)	ASSESSMENT	WEIGHT
1, 2, 3, 4, 5	Quizzes	15%
1, 2, 3, 4, 5	Learning Activities	20%
1, 2, 3, 4, 5	Assignments	35%
1, 2, 3, 4, 5	Project	30%

Important: For details on each assignment and exam, please see the Course Offering Information.

PERFORMANCE STANDARDS

A minimum grade of D is required to pass this course. However, a program may require a higher grade in this course to progress in the program or to meet specific program completion requirements.

Please consult with the program area or contact the program chair for further details. A minimum Grade Point Average of 2.0 is required for graduation.

GRADING SCHEME

Grade	Percentage	Grade Point	Description
A+	95-100	4.0	Exceptional: superior knowledge of subject matter
A	90-94	4.0	Excellent: outstanding knowledge of subject matter
A-	85-89	3.67	
B+	80-84	3.33	
B	75-79	3.0	Very Good: knowledge of subject matter generally mastered
B-	70-74	2.67	
C+	67-69	2.33	
C	64-66	2.0	Satisfactory/Acceptable: knowledge of subject matter adequately mastered

C-	60-63	1.67	
D+	57-59	1.33	
D	50-56	1.0	Minimal Pass
F	Less than 50	0.0	Fail: an unsatisfactory performance

REQUIRED LEARNING RESOURCES

Jukic, Vrbsky, Nestorov. Database Systems: Introduction to Databases and Data Warehouses, 1st Edition. Prospect Press, 2016

Additional learning resources may be found in the Course Offering Information or in Brightspace.

ADDITIONAL INFORMATION

Additional information may be found in the Course Offering Information or in Brightspace.

ACADEMIC ACCOMMODATIONS

Learners with a disability (learning, physical, and/or mental health) may qualify for academic and exam accommodations. For more information, or to apply for accommodations, learners should make an appointment with Accessibility Services in the Learner Success Services (LSS) Department. Accessibility Services can also assist learners who may be struggling with learning but do not have a formal diagnosis. To make an appointment visit LSS on the first floor of the south campus or call 403-410-1440. It is the learner's responsibility to contact Accessibility Services and request academic accommodations. For more information, please visit our website at http://www.bowvalleycollege.ca/accessibility.

INSTITUTIONAL POLICIES

Bow Valley College is committed to the highest standards of academic integrity and honesty. Learners are urged to become familiar with and uphold the following policies: Academic Integrity (500-1-7), Learner Code of Conduct, Procedures and Guidelines (500-1-1), Learner Appeals (500-1-12), Attendance (500-1-10), Grading (500-1-6), Academic Continuance and Graduation (500-1-5), and Electronic Communications (300-2-13). Audio or video recording of lectures, labs, seminars, or any other teaching and learning environment by learners is allowed only with consent of the instructor as part of an approved accommodation plan.

Recorded material is to be used solely for personal study and is not being used or distributed without prior written consent from the instructor.

Turnitin:

Students may be required to submit their course work to Turnitin, a third-party service provider engaged by BVC. Turnitin identifies plagiarism by checking databases of electronic books and articles, archived webpages, and previously submitted student papers. Students acknowledge that any course work or essays submitted to Turnitin will be included as source documents in the Turnitin.com reference database, where it will be used solely to detect plagiarism. The terms that apply to a student's use of Turnitin are described on Turnitin.com.

Online Exam Proctoring:

Examinations for this course may require proctoring through an online proctoring service. Online proctoring enables online exam taking within a controlled and monitored environment, thereby enhancing academic integrity. Online proctoring may occur through a variety of methods, including but not limited to:

a. live online proctoring where a remote invigilator authenticates identity and observes completion of an exam using specialized software and recordings;
b. automated proctoring where the exam session is recorded and AI (artificial intelligence) analyzed;
c. browser lockdown that limits access to other applications, websites, copying, printing, screen capture and other functions; or
d. a combination of both live/automated proctoring and browser lockdown.

Course instructors will review recordings, analyses, and data obtained through online proctoring for academic integrity infractions. It is the student's responsibility to meet the technical, software, location, and identity verification requirements necessary to enable online proctoring.

Further details of these policies are available in the Academic Calendar and on the Bow Valley College website, bowvalleycollege.ca.

Learners are encouraged to keep a copy of this course outline for future reference.

Collection of Personal Information:

This course, including your image and voice, may be recorded and made available to you and other students taking the course section. By attending the class(es) online or in person, you consent to the collection of your personal information. If you do not wish to be recorded, please contact your instructor before starting the course/class to discuss alternative arrangements.

You may use the recordings only for educational purposes and you must not copy, share, or use the recordings for any other purpose without the instructor's express permission.

Your personal information is collected in accordance with section 33(c) of the Freedom of Information and Protection of Privacy Act (Alberta) to deliver academic programming, support learner flexibility, promote universal design for learning principles, and for purposes consistent with the course activities and outcomes.

If you have any questions about the collection, disclosure, use, or protection of this information, please contact the College's Access and Privacy Officer at foip@bowvalleycollege.ca.