Algonquin College Logo

# ****COURSE SECTION INFORMATION (CSI)****

**Term: Winter 2023**

## **CST2355 - Database Systems**

## **Section 300 (Theory) & 301, 302, 303 (Labs) – Sarfraz Khan Section 304 (Lab) – Douglas King / Siju Phillips**

**Computer Programmer**

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| **Professor’s Name:** | Sarfraz Khan (Section 300) |
| **Email/Contact Info:** | **Sarfraz Khan** [**khans@algonquincollege.com**](mailto:khans@algonquincollege.com) **(Week 1-15)**  **Douglas King** [**kingd@algonquincollege.com**](mailto:kingd@algonquincollege.com) **(Week 1-7)**  **Siju Phillips** [**philips@algonquincollege.com**](mailto:philips@algonquincollege.com) **(Week 9-15)** |
| **Class Times:** | Theory Fri 17:00-19:00 T119 (Section 300) Khan  Lab Mon 08:30-10:00 T303 (Section 301) Khan  Lab Thu 12:30-14:30 P215 (Section 302) Khan  Lab Wed 15:00-17:00 B156 (Section 303) khan  Lab Tue 18:00-20:00 B432 (Section 304) King |

### Learning Resources

**Required Resources**

* + - The required textbook and materials are the same as those listed in the approved course outline available in the learning management system.

**Additional Reference/Supporting Resources (specific to this course section)**

* + - Other related materials will be provided to the students as required.
    - Each week, the professor will hold a 2 hour lecture/seminar during which material will be presented and discussed. This session is treated as a “Hybrid” session which means that there is an expectation of approximately 1 hour additional per week in time that each student is expected to spend on reading, research or other specific activities in addition to the theory sessions. This may take the form of online tutorials or exercises associated with particular software components used in the course.
    - There will also be a 2 hour laboratory session each week during which the students will work on their lab-related assignments. The professor will be available during the laboratory periods for demonstrations of the lab assignments.
    - In addition to the lecture and laboratory sessions, students are expected to spend a significant amount of time outside of class. This course requires students to setup several database development environments for use in their labs. Details of the required development environment setup will be outlined during the classes and laboratory sessions.

### Evaluation Breakdown

| **Assessment** | **Value** | **CLRs** |
| --- | --- | --- |
| Lab 1: MS Access – installation and capabilities | 4.44% | 1, 2, 3, 7 |
| Lab 2: MS Access - Part 2 | 4.44% | 1, 2, 3, 7 |
| Lab 3: MS SQL Server - Installation and Upsizing (Part 1) | 4.44% | 1, 2, 3, 6, 7 |
| Lab 4: MS SQL Server - Features, Security, Upsizing | 4.44% | 1, 2, 3, 6, 7 |
| Lab 5: SQL Server - Functions, Procedures, ROLLUP, CUBE | 4.44% | 1, 2, 3, 6, 7 |
| MIDTERM TEST (60 min) – open book | 30% | 1, 2, 3, 6, 7 |
| Lab 6: PostgreSQL & PgModeler – installation and features | 4.44% | 1, 2, 3, 4, 5, 6, 7 |
| Lab 7: ORACLE Server – Installation, Triggers | 4.44% | 1, 2, 3, 4, 5, 6, 7 |
| Lab 8: ORACLE PL/SQL Functions | 4.44% | 1, 2, 3, 4, 5, 6, 7 |
| Lab 9: ORACLE PL/SQL Functions (Part 2) | 4.48% | 1, 2, 3, 4, 5, 6, 7 |
| FINAL EXAM (90 min) – open book | 30% | 1, 2, 3, 4, 5, 6, 7 |

### Learning Schedule *(subject to change with notification)*

| **Date** | **Weekly Theme and Learning Outcomes** | **Learning Activities** | **Assessments (%)** | **Resources** | **CLRs** |
| --- | --- | --- | --- | --- | --- |
| **Week 1 (**Jan 9th) | * Course overview – detailed review of course outline and course section information * Introduce “big-picture” context for the course   + A layered system architectural approach to database design and implementation   + Current trends – relational, JSON, NoSQL, Graph databases, etc. * Microsoft Access Architecture (Introduction) | * 2 hour lecture session (hybrid) * 2 hour lab session to begin development setup | * None | * Review textbook Chapter 1: Introduction * Review textbook Chapter 2: Introduction to Structured Query Language * MS-Access online tutorials re. Northwind example database | 1, 2, 3, 7 |
| **Week 2** (Jan 16th) | * Microsoft Access examples; Northwind database   + User forms   + Reports   + Queries   + Grouping   + External data | * 2 hour lecture session (hybrid) * 2 hour lab session | * Lab 1: MS Access – installation and capabilities (4.44%) | * Review textbook Chapter 3: The Relational Model and Normalization * Review textbook Chapter 4: Database Design Using Normalization * MS-Access online tutorials re. Northwind example database | 1, 2, 3, 7 |
| **Week 3** (Jan 23rd) | * Microsoft Access examples; Northwind database   + Reporting   + Update Queries   + Triggers   + Queries * ODBC and connectivity | * 2 hour lecture session (hybrid) * 2 hour lab session | * Lab 2 - MS Access - Part 2 (4.44%) | * Review textbook Chapter 7: SQL for Database Construction and Application Processing * MS-Access online tutorials re. links in PowerPoint. | 1, 2, 3, 7 |
| **Week 4** (Jan 30th) | * Microsoft SQL Server   + Features   + Security   + Upsizing * ODBC and connectivity | * 2 hour lecture session (hybrid) * 2 hour lab session | * Lab 3: Lab 3 - MS SQL Server - Installation and Upsizing (Part 1) (4.44%) | * Review textbook Chapter 8: Database Redesign * Review textbook Chapter 9: Managing Enterprise Databases | 1, 2, 3, 6, 7 |
| **Week 5** (Feb 6th**)** | * Microsoft SQL Server   + Modelling   + Administration   + Security   + Functions   + Stored Procedures   + Triggers | * 2 hour lecture session (hybrid) * 2 hour lab session | * Lab 4: MS SQL Server - Features, Security, Upsizing (4.44%) | * Review textbook Chapter 5: Data Modelling with the Entity-Relationship Model * Review textbook Chapter 6: Transforming Data Models into Database Designs | 1, 2, 3, 6, 7 |
| **Week 6** (Feb 13th) | * Microsoft SQL Server   + Architecture   + Connectivity * Data Warehousing tools | * 2 hour lecture session (hybrid) * 2 hour lab session | * Lab 5: SQL Server - Functions, Procedures, ROLLUP, CUBE (4.44%) | * Review textbook Chapter 9: Managing Enterprise Databases | 1, 2, 3, 6, 7 |
| **Week 7** (Feb 20th) | * MIDTERM TEST – open book covering all material up to this point   + Multiple choice / short answer questions   + 60 minutes duration | * MIDTERM TEST * 2 hour lab session * Late lab work can be demonstrated during lab | * MIDTERM TEST:  (30%) |  | 1, 2, 3, 4, 5, 6, 7 |
| **Week 8** | BREAK | BREAK | BREAK | BREAK |  |
| **Week 9** (Mar 6th) | * Take-up Midterm Exam in class * PostgreSQL & MySQL   + Architecture, features   + Security | * 2 hour lecture session (hybrid) * 2 hour lab session | * Prepare for Lab 6 | * Review textbook Chapter 11: The Web Server Environment | 1, 2, 3, 6, 7 |
| **Week 10** (Mar 13th) | * ORACLE   + Architecture   + PL/SQL introduction | * 2 hour lecture session (hybrid) * 2 hour lab session | * Lab 6: PostgreSQL & PgModeler – installation and features (4.44%) | * Review textbook Chapter 10: Managing Databases with Microsoft SQL Server 2019, Oracle Database, and MySQL 8.0 * Online Oracle materials covering Oracle 19c * Review Materials posted in Brightspace | 1, 2, 3, 4, 5, 6, 7 |
| **Week 11** (Mar 20th) | * ORACLE   + PL/SQL Functions, Packages | * 2 hour lecture session (hybrid) * 2 hour lab session | * Lab 7: ORACLE Server – Installation, Triggers (4.44%) | * ORACLE programming online tutorials re. links in PowerPoint | 1, 2, 3, 4, 5, 6, 7 |
| **Week 12** (Mar 27th) | * ORACLE   + PL/SQL Functions, Packages (continued)   + Sharing items in package memory   + Built-in Functions and Packages   + Performance considerations   + Indexes   + Transaction   + materialized views   + Container database | * 2 hour lecture session (hybrid) * 2 hour lab session | * Lab 8: ORACLE PL/SQL Functions (4.44%) | * ORACLE programming online tutorials re. links in PowerPoint. | 1, 2, 3, 4, 5, 6, 7 |
| **Week 13** (Apr 3rd) | * ORACLE   + Indexes   + XML   + JSON   + ODBC * Data warehousing | * 2 hour lecture session (hybrid) * 2 hour lab session | * Lab 9: ORACLE PL/SQL Functions (Part 2) (4.48%) | * Review textbook Chapter 12: Data Warehouses and Business Intelligence Systems * Review textbook Chapter 13 Big Data, NoSQL and the Cloud * Review textbook Appendix H: XML | 1, 2, 3, 4, 5, 6, 7 |
| **Week 14** (Apr 10th) | * Review and preparation for final exam (multiple-choice and/or short answer) * Back to the big picture | * 2 hour lecture session (hybrid) * 2 hour lab session * Late lab work can be demonstrated during lab |  |  | 1, 2, 3, 4, 5, 6, 7 |
| **Week 15** (Apr 17th) | * FINAL EXAM – open book - **covering all material after BREAK week**.   + Multiple choice / short answer questions   + 90 minutes duration | FINAL EXAM | FINAL EXAM (30%) |  | 1, 2, 3, 4, 5, 6, 7 |

**Lab Rules:**

* There are 9 labs in the course worth 40% of the total grade.
* This course requires passing theory and lab components individually by scoring 50% or more in each component.
* Submit complete and correct lab by the “Due Date” for 100% score.
* Labs submitted after “Due Date” but before “End Date” will be penalized minus 50% of the grade.
* Labs will not be accepted for grading after “End Date”.

**Lab Schedule:**

Lab#1 to Lab#6 will be available from Jan 9th (Start Date) until Feb 17th (End Date).

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| **Labs#** | **Week#** | **Due Date** | **Grade Value** |
| Lab#1 | Week#2 | Jan 22nd 2023 | 4.44% |
| Lab#2 | Week#3 | Jan 29th 2023 | 4.44% |
| Lab#3 | Week#4 | Feb 5th 2023 | 4.44% |
| Lab#4 | Week#5 | Feb 12th 2023 | 4.44% |
| Lab#5 | Week#6 | Feb 19th 2023 | 4.44% |

Lab#6 to Lab#10 will be available from Feb 27th (Start Date) until Apr 16th (End Date).

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| Lab#6 | Week#9 | Mar 19th, 2023 | 4.44% |
| Lab#7 | Week#10 | Mar 26th, 2023 | 4.44% |
| Lab#8 | Week#11 | Apr 2nd, 2023 | 4.44% |
| Lab#9 | Week#12 | Apr 9th, 2023 | 4.48% |

Note: Contact your lab professor for any further assistance or accommodation.

### Other Important Information

### *All sessions will be delivered in person on campus. Some recordings may be made available using Zoom Classroom links available in Brightspace under Tools > Zoom Classroom (as required)*

* Labs are expected to be completed during the laboratory session, but will be considered as “on-time” if submitted and demonstrated before the end of the week in which the laboratory was scheduled and normally due. The due dates are as posted in Brightspace.
* Any written answers for the labs should be submitted using the learning management system, as per the particular instructions included with the individual lab.
* **If requested, lab work must be demonstrated to the professor, unless documented in enough detail to show the work is complete**.
* All lab submissions must be handed in by the due date unless prior permission has been granted by the professor. All late submissions are subject to a deduction of at least 25% of the grade for that particular submission (unless permission has been granted by the professor). Submissions submitted more than 1 week late will normally receive a grade of 0.

### *Department Grading Policy: - For all courses (including this one) that have both a theory and practical (lab) component, students must have a grade of at least 50% (or “D-”) on both the theory component as well as in the practical (i.e. lab) component in order to achieve a passing grade in the course. i.e. Even if your combined grade exceeds 50% for the entire course, if you fail either the theory component or the practical component, you will not achieve a passing grade in the course and will be assigned a grade of F.*

* **Theory: MIDTERM TEST (30%) + FINAL EXAM (30%) = 60% : must receive at least 30/60.**
* **Labs: 9 labs totaling 40%: must receive at least 20/40.**

### *Please note that the Evaluation/Earning Credit section of the course outline posted on the BrightSpace learning management system contains a mapping of the list of Course Learning Requirements to how they are covered by the exams, labs, and assignment activities.*

### *See the course outline as posted on BrightSpace for other important information including:*

* College grading numerical equivalences
* Prior Learning Assessment and Recognition
* Attendance

### *Make sure that you carefully comply with the Algonquin College policies with respect to academic integrity and plagiarism. This is particularly important in group work situations. Don’t let someone copy someone else’s work and pass it off as their own. If you want to use someone’s material, you can ask the professor in advance for suggestions on how to properly present the work. The idea is clear; you cannot just copy & paste examples from the Internet to build up deliverables* that you claim are your work.