

RYERSON UNIVERSITY

Ted Rogers School of Information Technology Management
And G. Raymond Chang School of Continuing Education

(C)ITM 617 – Physical Database Design and Implementation

COURSE OUTLINE FOR 2020-2021

1.0 PREREQUISITE(S)

The prerequisite for this course is ITM 500. Students who do not have the prerequisite will be dropped from the course.

2.0 INSTRUCTOR INFORMATION

- Name:
- Office Phone Number:
- E-mail address:
- Faculty/course web site(s): <https://my.ryerson.ca>
- Office Location & Consultation hours:
 - Your instructor is available for virtual consultation during scheduled consultation hours. Information on the consultation format is provided in the D2L course shell. If you wish to make an appointment, kindly do so via email to ensure the professor is available.
- E-mail Usage & Limits:

Students are expected to monitor and retrieve messages and information sent through D2L and Ryerson email on a frequent and consistent basis. In accordance with the policy on Ryerson student email accounts ([Policy 157](#)), Ryerson requires that any electronic communication by students to Ryerson faculty or staff be sent from their official Ryerson email account. Messages from other accounts may be disregarded.

3.0 CALENDAR COURSE DESCRIPTION

This course covers aspects of the physical design, implementation and data base performance analysis for business applications. Students will learn to develop physical database requirements from Logical Designs, and to analyze query processing performance of the physical implementations. In addition to weekly labs the course will include a design project which will help students to develop competence with standard database definition (DDL/SQL) and procedural languages (PL/SQL) for defining physical schemas and developing stored procedures, triggers and user 2 of 5

functions. The course will utilize state of the art data base design tools and relational database software.

4.0 COURSE OBJECTIVES AND LEARNING OUTCOMES

To acquire knowledge of and competency in the major techniques used the physical design of relational databases for business applications. To acquire a competency in developing database solutions that will meet the functional, efficiency, effectiveness and security requirements of the business.

COURSE OBJECTIVES

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

1. Understand and articulate the Relational Database concept and its role in business
2. Convert Logical Relational Models to appropriate Physical Schema
3. Define tables using appropriate data types and constraints
4. Profile and size Transaction processing requirements
5. Understand the role and function of indexes and define and apply appropriately
6. Estimate and allocate initial and growth space requirements
7. Select appropriate file and file group allocations
8. Understand Partitioning and apply appropriately
9. Analyse and design SQL queries for optimum performance
10. Understand the role of stored procedures and trigger and the basic ISQL coding involved
11. Be competent in the use of relevant industry representative software

5.0 TEXTS & OTHER READING MATERIALS

Title: Pro SQL Server Relational Database Design and Implementation

Author: Louis Davidson & Jessica Moss

Publisher: Apress

ISBN: 978-1484219720

6.0 TEACHING METHODS

This course will incorporate the following teaching/learning methods lecture, laboratory assignments, problem-based learning and group projects.

7.0 EVALUATION, ASSESSMENT AND FEEDBACK

The grade for this course is composed of the mark received for each of the following components:

Evaluation Component	Percentage of the Final Grade
Weekly Labs	10%
Assignment 1	10%
Assignment 2	10%
Mid Term Examination	20%
Final Examination	50%
Total	100%

NOTE: Students must achieve a course grade of at least 50% to pass this course.

- ❖ At least **20%** of student's grade based on individual work will be returned to students prior to the last date to drop a course in [good academic standing](#).

Citation Format for Essays and Term Papers

All essay assignments, term paper and other written works must adhere with APA citation format. Technical errors (spelling, punctuation, proofing, grammar, format, and citations) and/or inappropriate levels of language or composition will result in marks being deducted. You are encouraged to obtain assistance from the Writing Centre (www.ryerson.ca/writingcentre) for help with your written communications as needed.

You can find APA guidelines and academic referencing from the following online resources:

[Student Learning Support > Online Resources > Writing Support Resources](#)

- [APA Basic Style Guide](#)

[Ryerson Library Citations and Style Guides](#)

- [APA Style](#)

POSTING OF GRADES

- All grades, on assignments or tests must be posted or made available to students through the return of their work. Grades on final exams must be posted. However, as there may be other consideration in the determination of final grades, students will receive their official final grade in the course only from the Registrar. Final official course grades may not be posted or disclosed anywhere by an instructor.
- Posting of grades on the Course Management System (D2L Brightspace) is preferred. If grades are posted in hard copy they must be posted numerically sorted by student identification number after at least the first four digits have been removed. Instructors must inform students in all course management documentation of the method to be used in the posting of grades. Students who wish not to have their grades posted must inform the instructor in writing.
- Some graded work will be returned to students prior to the last date to drop a course without academic penalty.
 - ❖ All assignments submitted for grading will be handed back as soon as possible, except for the final exam.
 - ❖ Some graded work will be returned to students prior to the last date to drop a course without academic penalty.

8.0 TOPICS – SEQUENCE & SCHEDULE

Session	Weekly Topic with Learning Objectives	Readings
---------	---------------------------------------	----------

1	Review of the Relational Model <ul style="list-style-type: none"> • Explain the advantages of Relational Databases • Explain Relational DB development and role of DBMS • Explain Relational Concepts • Explain Primary and Foreign Keys and Referential Integrity 	Chap 1 and 2
2	Create Database and Table Definitions <ul style="list-style-type: none"> • Understand naming conventions • Select Primary Keys • Implement Domains • Understand characteristics of different data types • Use DDL to create database 	Chap 6
3	Referential Integrity and Constraints <ul style="list-style-type: none"> • Implement Check Constraints 	Chap 7
4	Indexes <ul style="list-style-type: none"> • Understand basic index structure • Understand and Implement different index types • Monitor and evaluation index usage 	Chap 10
5	Estimating Space and Transaction Volumes <ul style="list-style-type: none"> • Calculate Space requirements • Estimate Transaction Volumes • Estimate I/O activity 	Handouts
6	Mid Term Examination	
7	Data Access Strategy <ul style="list-style-type: none"> • Design and Implement Shared Plans and Parametrization • Design and Implement Stored Procedures using T-SQL • Understanding performance issues 	Chap 13
8	Triggers <ul style="list-style-type: none"> • Design and Implement DML Triggers • Implement an audit trail • Implement error handling techniques 	Chap 7, Append B
9	Concurrency and Stored Procedures <ul style="list-style-type: none"> • Understand the concept of concurrency • Understand the concept of a transaction • Design and Implement stored procedures 	Chap 11
10	Security <ul style="list-style-type: none"> • Define and Implement Schemas and Roles • Define and Implement table, column and row level security • Define and Implement views and stored procedures 	Chap 9
11	Case Study <ul style="list-style-type: none"> • Consolidation of course concepts 	Handout
12	Review	

- | | | |
|--|---|--|
| | <ul style="list-style-type: none">• Adequately prepare for Final Exam | |
|--|---|--|

9.0 VARIATIONS WITHIN A COURSE

All sections of a course (Day and CE sections) will follow the same course outline and will use the same course delivery methods, methods of evaluation, and grading schemes. Any deviations will be posted on D2L Brightspace once approved by the course coordinator.

10.0 OTHER COURSE, DEPARTMENTAL, AND UNIVERSITY POLICIES

For more information regarding course management and departmental policies, please consult the [Course Outline Appendix](#) which is posted on the [Ted Rogers School of Information Technology Management website](#).

NOTE: Students must adhere to all relevant university policies found in their online course shell in D2L and /or on the following URL: [senate-course-outline-policies](#).

The appendix covers the following topics:

- Attendance & Class Participation
- Email Account
- Request for Academic Consideration
- Examinations & Tests
- Late Assignments
- Standard of Written Work
- Academic Grading Policy
- Academic Integrity
- Student Rights

Important Resources Available at Ryerson

- [Academic Accommodation Support](#): Ryerson University acknowledges that students have diverse learning styles and a variety of academic needs. If you have a diagnosed disability that impacts your academic experience, connect with Academic Accommodation Support (AAS). Visit the [AAS website](#) or contact asadmin@ryerson.ca for more information. Note: All communication with AAS is voluntary and confidential, and will not appear on your transcript.
- [The Library](#) provides research workshops and individual assistance. If the University is open, there is a Research Help desk on the second floor of the library, or go to [Workshops](#).

- [Student Learning Support](#) offers group-based and individual help with writing, math, study skills, and transition support, as well as [resources and checklists to support students as online learners](#).
- You can submit an [Academic Consideration Request](#) when an extenuating circumstance has occurred that has significantly impacted your ability to fulfill an academic requirement.
- [Ryerson COVID-19 Information and Updates for Students](#) summarizes the variety of resources available to students during the pandemic.
- Familiarize yourself with the tools you will need to use for remote learning. The [Continuity of Learning Guide](#) for students includes guides to completing quizzes or exams in D2L or Respondus, using D2L Brightspace, joining online meetings or lectures, and collaborating with the Google Suite.