

# **RYERSON UNIVERSITY**

## **Ted Rogers School of Information Technology Management and G. Raymond Chang School of Continuing Education**

### **COURSE OF STUDY 2017-2018**

## **(C)ITM 617 – Physical Database Design and Implementation**

### **1.0 PREREQUISITE**

The prerequisite for this course is ITM 500 or Direct Entry. 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 personal consultation during scheduled consultation hours which are posted on their office door or on the course shell in D2L Brightspace. However, you are advised to make an appointment by e-mail or by telephone before coming to ensure that the professor is not unavoidably absent.
- E-mail Usage & Limits:

Students are expected to monitor and retrieve messages and information issued to them by the University via Ryerson online systems on a frequent and consistent basis. ***Ryerson requires that any official or formal electronic communications from students be sent from their official Ryerson E-mail account.*** As such emails from other addresses may not be responded to.

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

#### **4.0 COURSE OVERVIEW**

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.

#### **5.0 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

#### **6.0 EVALUATION**

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

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

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

#### **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](http://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:

- a) Ryerson Writing Support Web site:

<http://www.ryerson.ca/content/dam/studentlearningsupport/resources/citation-conventions/APA%20Basic%20Style%20Guide.pdf>

b) Ryerson Library for APA style guide: <https://library.ryerson.ca/guides/style/>

## 7.0 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.

## 8.0 TOPICS – SEQUENCE & SCHEDULE

Session	Weekly Topic with Learning Objectives	Readings
1	Review of the Relational Model	Chap 1 and 2
	<ul style="list-style-type: none"> <li>• Explain the advantages of Relational Databases</li> </ul>	
	<ul style="list-style-type: none"> <li>• Explain Relational DB development and role of DBMS</li> </ul>	
	<ul style="list-style-type: none"> <li>• Explain Relational Concept</li> </ul>	
	<ul style="list-style-type: none"> <li>• Explain Primary and Foreign Keys and Referential Integrity</li> </ul>	
2	Create Database and Table Definitions	Chap 6
	<ul style="list-style-type: none"> <li>• Understand naming conventions</li> </ul>	
	<ul style="list-style-type: none"> <li>• Select Primary Keys</li> </ul>	
	<ul style="list-style-type: none"> <li>• Implement Domains</li> </ul>	
	<ul style="list-style-type: none"> <li>• Understand characteristics of different data types</li> </ul>	
	<ul style="list-style-type: none"> <li>• Use DDL to create database</li> </ul>	
3	Referential Integrity and Constraints	Chap 7
	<ul style="list-style-type: none"> <li>• Implement Check Constraints</li> </ul>	
4	Indexes	Chap 10
	<ul style="list-style-type: none"> <li>• Understand basic index structure</li> </ul>	
	<ul style="list-style-type: none"> <li>• Understand and Implement different index types</li> </ul>	
	<ul style="list-style-type: none"> <li>• Monitor and evaluation index usage</li> </ul>	
5	Estimating Space and Transaction Volumes	Handouts
	<ul style="list-style-type: none"> <li>• Calculate Space requirements</li> </ul>	
	<ul style="list-style-type: none"> <li>• Estimate Transaction Volumes</li> </ul>	
	<ul style="list-style-type: none"> <li>• Estimate I/O activity</li> </ul>	
6	Mid Term Test	

7	Data Access Strategy	Chap 13
	<ul style="list-style-type: none"> <li>• Design and Implement Shared Plans and Parametization</li> <li>• Design and Implement Stored Procedures using T-SQL</li> <li>• Understanding performance issues</li> </ul>	
8	Triggers	Chap 7, Append B
	<ul style="list-style-type: none"> <li>• Design and Implement DML Triggers</li> <li>• Implement an audit trail</li> <li>• Implement error handling techniques</li> </ul>	
9	Concurrency and Stored Procedures	Chap 11
	<ul style="list-style-type: none"> <li>• Understand the concept of concurrency</li> <li>• Understand the concept of a transaction</li> <li>• Design and Implement stored procedures</li> </ul>	
10	Security	Chap 9
	<ul style="list-style-type: none"> <li>• Define and Implement Schemas and Roles</li> <li>• Define and Implement table, column and row level security</li> <li>• Define and Implement views and stored procedures</li> </ul>	
11	Case Study	Handout
	<ul style="list-style-type: none"> <li>• Consolidation of course concepts</li> </ul>	
12	Review	
	<ul style="list-style-type: none"> <li>• Adequately prepare for Final Exam</li> </ul>	

## 9.0 TEACHING METHODS

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

## 10.0 TEXTS & OTHER READING MATERIALS

**Title:** Pro SQL Server Relational Database Design and Implementation

**Author:** Louis Davidson & Jessica Moss

**Publisher:** Apress

**ISBN:** 978-1484219720

## 11.0 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.

## 12.0 OTHER COURSE, DEPARTMENTAL, AND UNIVERSITY POLICIES

- For more information regarding course management and departmental policies, please consult the ‘**Appendix of the Course of Study**’ which is posted on the Ted Rogers School of Information Technology Management website, <http://www.ryerson.ca/content/dam/itm/documents/cos/Appendix.pdf>. This appendix covers the following topics:
  - 12..1 Attendance & Class Participation
  - 12..2 Email Usage
  - 12..3 Request for Academic Consideration

- 12..3.1** Ryerson Health Certificate
    - 12..3.2** Academic Accommodation for Students with Disabilities
    - 12..3.3** Religious, Aboriginal or Spiritual Observance
    - 12..3.4** Re-grading and Recalculation
  - 12..4** Examinations & Tests
    - 12..4.1** Period of Prohibition from Testing
    - 12..4.2** Make-Up of Mid-Term Tests, Assignments and Other Assessments
      - During the Semester
    - 12..4.3** Make -Up of Final Exams
    - 12..4.4** Missing a Make-Up
- 12..5** Late Assignments
- 12..6** Standard of Written Work
- 12..7** Academic Grading Policy
- 12..8** Academic Integrity
  - 12..8.1** Turnitin.com
- 12..9** Student Rights