Assignment #1

Entity Relationship Diagram (ER Model)

Within the context of CONCEPTUAL DATA MODELING

Due: Tuesday, January 29, 2019 **at 2:30pm** in lecture room (O 222)

(LATE ASSIGNMENTS WILL NOT BE MARKED)

PURPOSE

This assignment is to design a conceptual model using the following narrative.

SUBMISSION

Your submission will consist of an ER model together with supporting assumptions if any, that you may need to make during the modeling process.

Submissions need to be made IN CLASS on the date / time specified above.

GENERAL INSTRUCTIONS:

- **You may choose to hand-draw the ERD**; but you **<u>must</u>** follow the standards and it must be neatly done on plain A4 size paper (no pages off a wire bound notebook) and professional looking (using a ruler perhaps). Multiple sheets have to be stapled. Folded corners or paper clips to keep additional papers together is NOT allowed.

  If the above requirement is not followed, you will obtain a mark of ZERO for the entire assignment.

  Your diagram should follow the conventions and standards presented in class.

  You may either choose to use the *bubble notation* or you can choose to list the attributes inside an entity as shown in class. Relationships are to be modelled using *crow's feet notation*.

  Show all entities, descriptive attributes, relationships, and their cardinalities.

  Represent attributes identifying their types (composite, derived, multi-valued etc.)

  Choose entity and attribute names carefully.

  Note: You may use any drawing tool like gliffy (http://www.gliffy.com/) or a modeling tool like MS Visio (lab installs). You could use any other tool (there are many available today) if you so wish.

  Submit hard copies only. Electronic submissions are NOT allowed and will not be marked.

  Just so you are aware, some of the modeling tools may force you to add additional constraints which may not have been necessarily covered yet in class.

- Support your model with a list of **assumptions** (<u>if any</u>). Handwritten is fine, as long as it is neat and readable. You can do this using Word, but submit a printed copy only. This document is to be stapled together with the model and needs to be submitted at the same time.

Ensure that you do individual work. Remember that this is not a group assignment. You may be asked to explain your answer. Besides, it will in no way benefit you if you copy the work from someone else.

CASE DESCRIPTION:

ITM Consultants Project System

ITM is a consulting firm that contracts IT personnel to clients for a variety of projects. They require a project assignment and billing database system that will be used to assign ITM employees to projects and to collect data that will be used for client billing.

The data stored for an ITM employee is employee number, name, social insurance number, mailing address, work telephone number, e-mail address and the IT related skills that the employee possesses. Skills include project management, SQL, Oracle database administration, web development, Java, Python etc. ITM maintains an inventory of skills and each is assigned a numeric code.

Clients are companies and the company name and billing address are stored in the database. ITM does business internationally, but you may assume that all clients are Canadian. There may be more than one project for a client, but all are billed to the same address. It is possible that there will be no projects in the system for a client company.

There must be a contact person in the client company for each project and all reasonable ways of contacting this individual are recorded. In addition, the project name, start date, planned completion date, approved budget and amount billed to date are recorded. An ITM employee is assigned as project manager for each project, although this might not be done until after the project has been entered into the system.

An employee can be assigned to several projects at the same time (including project management), but may not be currently assigned to any projects. ITM employee time is billed to the client by an hourly billing rate and this rate can vary from project to project.

Employees have supervisors to oversee, coach/mentor, and train them. Supervisors monitor productivity and provide constructive feedback and coaching. They also serve as a link between the subordinates and managers.

In addition, certain expenses can be billed to a project. The expense date, amount and description are recorded. Standard expense descriptions are coded, but this can be overridden and a description entered manually. Expenses are submitted to the project manager's office and entered from there. Their status in the system is either 'A' for approved by the project manager or 'B' for billed.

Employees enter time worked on projects at the end of every week using a form, the data entry part of which resembles the following:

Week Ending									
25-Jan-19									
Employee #	210020202	Last Name	Smith		First Name	John			
Project #	Project Name	Sat	Sun	Mon	Tue	Wed	Thurs	Fri	**Total**
	Daily Total								

Be sure to show how the daily hours will be represented. The status of employee time sheet entries in the system is either ‘S’ for submitted, ‘A’ for approved by the manager of the project or ‘B’ for billed.

Client billing is not part of the system to be developed.