CS309
Information and Database Systems

Fall 2023

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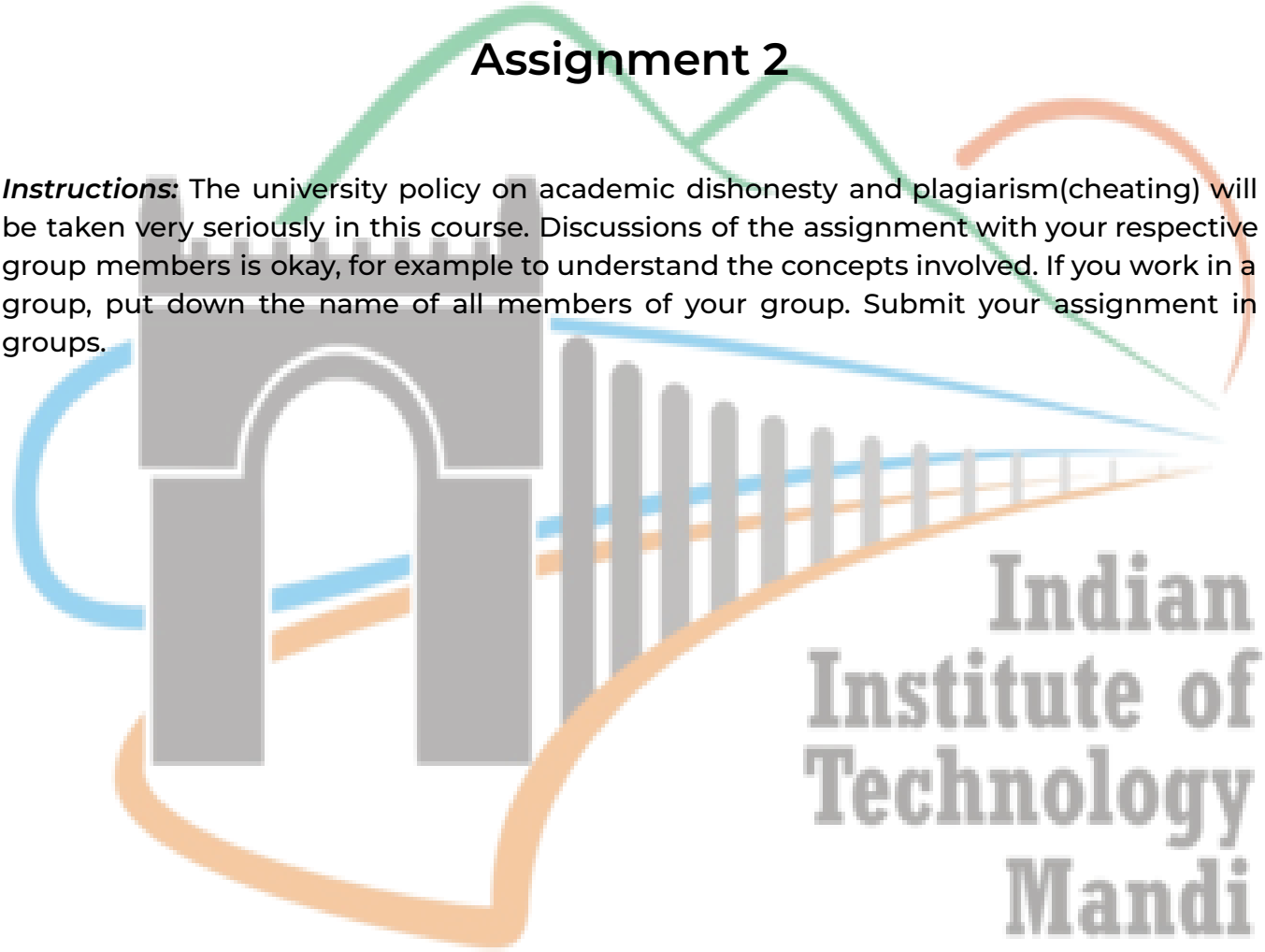
Assignment 2

Instructions: The university policy on academic dishonesty and plagiarism(cheating) will be taken very seriously in this course. Discussions of the assignment with your respective group members is okay, for example to understand the concepts involved. If you work in a group, put down the name of all members of your group. Submit your assignment in groups.



1. Make Entity Relationship Diagram for figure on Slide No.114 (Figure No.7.7) on Moodle. [10 marks]

2. Complete the EER Diagram related to ChatBox given in Assignment 1 overcoming the limitations you mentioned in the previous Assignment 1 Solution. (Make sure Union Type is used) [10 marks]

3. Problem Statement based on EER (Extended Entity Relationship) Diagram: [30 marks]

We wish to create a database for a company that runs training courses. For this, we must store data about the trainees and the instructors. For each course participant (about 5,000), identified by a code, we want to store his/her social security number, surname, age, sex, place of birth, employer's name, address and telephone number, previous employment duration (Start Date and End Date), the courses attended (there are about 200 courses) and the final assessment for each course. We need also to represent the seminars that each participant is attending at present and, for each day, the places and times the classes are held.

Each course has a code and a title and any course can be given any number of times. Each time a particular course is given, we will call it an 'edition' of the course. For each edition, we represent the start date, the end date, and the number of participants. If a trainee is self-employed, we need to know his/her area of expertise, and, if appropriate, his/her title. For somebody who works for a company, we store the level and position held. For each instructor (about 300), we will show the surname, age, place of birth, the edition of the course taught, those taught in the past and the courses that the tutor is qualified to teach. All the instructors' telephone numbers are also stored. An instructor can be permanently employed by the training company or freelance.

Design an EER-model considering the above requirements: clearly indicating Strong / Weak Entities, key attributes, their relationships, participation constraint using Min-max notation, class hierarchy, union types, aggregation. Make necessary assumptions about attributes of entity/relationship.

Note on EER exercises: EER modeling is as much a science as an art, and not a rote procedure. The purpose of this assignment is to give you a bit of practice in capturing informal descriptions in an EER diagram. Just like in real life, if you feel that not all the details that you need to know have been completely specified, use your common sense. If in doubt, explain explicitly what assumptions you are making and how they are shaping your model. Another good strategy is to follow standard examples, like those in the books and lectures, unless you have a reason for doing something different.

Basic SQL Query Format:

Select <column_names> from <table_name> where [condition];

Select	For selecting the data from the database and displaying results in tabular format.
column_names	Columns that should be returned in the resulting table.
table_name	Name of table which you want to query.
where	Contains the conditions that must be evaluated to true for a row to be returned as a result.

For further information, please refer here: https://www.w3schools.com/sql/sql_select.asp

4. Problem Statement based on Relational Model: [10 marks]

Consider the following schema for a database that keeps information about Student, Instructors, Courses Enrolled and Grades:

Student
(sid: integer, sname: string)
Course
(cid: string, iid: integer, cname: string)
Instructor
(iid: integer, iname: string)
Grades
(sid: integer, cid: string, grade: string)

Write SQL-Query for the following. If you need to make any particular assumptions, please list them.

1. Find the name of the students who have registered in the course with cid CS309.

   Select sname as Name from Student where sid IN (Select sid from Grades where cid = "CS309");

2. Find the ids of the students who never received a grade F. **(Hint: Use NOT IN)**
3. Give a list of all people (Instructors and Students), with their ID and name. **(Hint: Use UNION)**

********** Happy Learning **********