**CSCI 440**
**Database Systems**

# Technical Document I
# ER Diagram

due on (or before) Monday, 10.27 by 5pm

## Submission

There will be one hardcopy submission per group. You will submit your ER and the short writeup discussed below. This document will be graded pass/fail. If returned to you as a 'fail', you must revise and resubmit for a second attempt. Please put in due diligence on your first attempt.

## Deliverables

1. Draw an ER diagram for your database design. You may use any software tool of your choice. Use Chapter 7, particularly Figures 7.2 (p.204) and 7.14 (p.223), as your guide.
   Make sure to indicate:
   - primary keys,
   - all attributes,
   - composite attributes (if any),
   - meaningful derived attributes (if any),
   - relationship attributes (if any),
   - weak entities (if any),
   - cardinality constraints, and
   - participation constraints.
2. If there are extra constraints which cannot be captured by the E/R diagram, make sure you list them in supplimentary text.
3. List any assumptions you make in the process. Your E/R diagram should contain at least $\approx 6$ (or more) entities; otherwise it is likely not of sufficient complexity for a CSCI 440 project.
4. Make sure your diagram captures a significant number of relationships, and all those required to accomplish your project goals.
5. For each entity set and relationship, write a short description in plain English of what it represents or models. One or two sentences per entity set and relationship is enough. These descriptions are primarily to help me understand what you are modeling and ensure that you are modeling it correctly.

## Common ER Mistakes

1. If two different entities possess exactly the same set of attributes, they could be merged.
2. Duplication of attributes across several entities is not allowed, especially if the attributes are foreign keys.
3. Primary key should be introduced for every concept in an ER diagram.
4. Primary key attributes cannot be optional, they should be mandatory.
5. Primary keys of relationships are not allowed on an ER diagram.
6. Cardinalities of a relationship are from the set 1, M.
7. Participation cardinalities (optionality) of a relationship are from the set 0,1.
8. A relationship cannot be directly related to another relationship.
9. An entity cannot be directly related to another concept.
10. Composite properties should have as parts only properties, not values of properties.
11. Weak entity cannot be related to strong entity with cardinalities, different from (1,1):(1,M).
12. Participation cardinalities for aggregate entity and its parts are to be mandatory.

source: Keberle, Natalya, and Ivan V. Utkin. "Teaching Conceptual Modeling in ER: Chen Worlds." ICTERI. 2012.

---

## Extended Enitity-Relationship – Extra Credit

For extra credit, you may extend your ER diagram to an EER diagram. Although each group will work together to submit the ER diagram (above), the **extra credit is an individual exercise**. Do not consult your group for the EER diagram. Identical (or nearly identical) submissions will be thrown out and no EC points will be awarded to anyone in the group. Therefore, do not share your EER design nor discuss your approach with your teammates, under any circumstances.

Consult Chapter 8 of the textbook and Slide Deck 11 to guide you through this process.

There will be no revision process for the EER design. Successful submissions may recieve (up to) +1 point towards the final course grade. Those students who have missed multiple participation exercises are especially encouraged to complete this exercise.