

# Lab Assignment - 1

(60 marks)

## CS309 Information and Database Systems

### Problem Statements

1. Design an ER-model for given problem statement while considering the following points:  
**(30 marks)**

1. Clearly indicating Strong / Weak Entities, their relationships, participation constraint using min-max notation.
2. Indicate the role of each entity in a relationship if participating entities are the same.
3. Make suitable assumptions about attributes of entities/ relationships.
4. Clearly indicate key attributes, multi-valued attributes, and composite attributes of an entity (if any exists).

A university registrar's office maintains data about the following entities:

- (a) courses, including number, title, credits, syllabus, and prerequisites.
- (b) course offerings (or sections), including course number, year, semester, section number, instructor(s), timings, and classroom.
- (c) students, including student-id, name, and program.
- (d) instructors, including identification number, name, department, and title.

Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled.

Construct an E-R diagram for the registrar's office. Document all assumptions that you make about the mapping constraints.

2. Design an ER model for the relationship between company, job applicant, and job offer. Mention why ternary relationships or multiple binary relationships are appropriate or not for the E-R diagram. Give proper justification for your answers. Clearly indicate each of the entities should have total or partial participation in your ER diagram.  
**(15 marks)**
3. Read about different applications like slack, microsoft teams, google spaces/hangout, whatsapp etc. from the internet and try to compare them and list the limitations of each.

Accordingly, design an EER-model from concepts studied in class, for a chat box you want to create for our university. Students/instructors should be able to create meetings, groups, or individually chat with each other, etc. Write down the limitations you can see in the EER-model you have created using concepts studied in class till now.

**(15 marks)**