BITS, PILANI – K. K. BIRLA GOA CAMPUS

Database Systems

(CS F212)

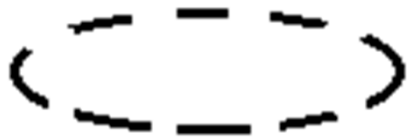
by

Dr. Mrs. Shubhangi Gawali

Dept. of CS and IS

Derived attribute

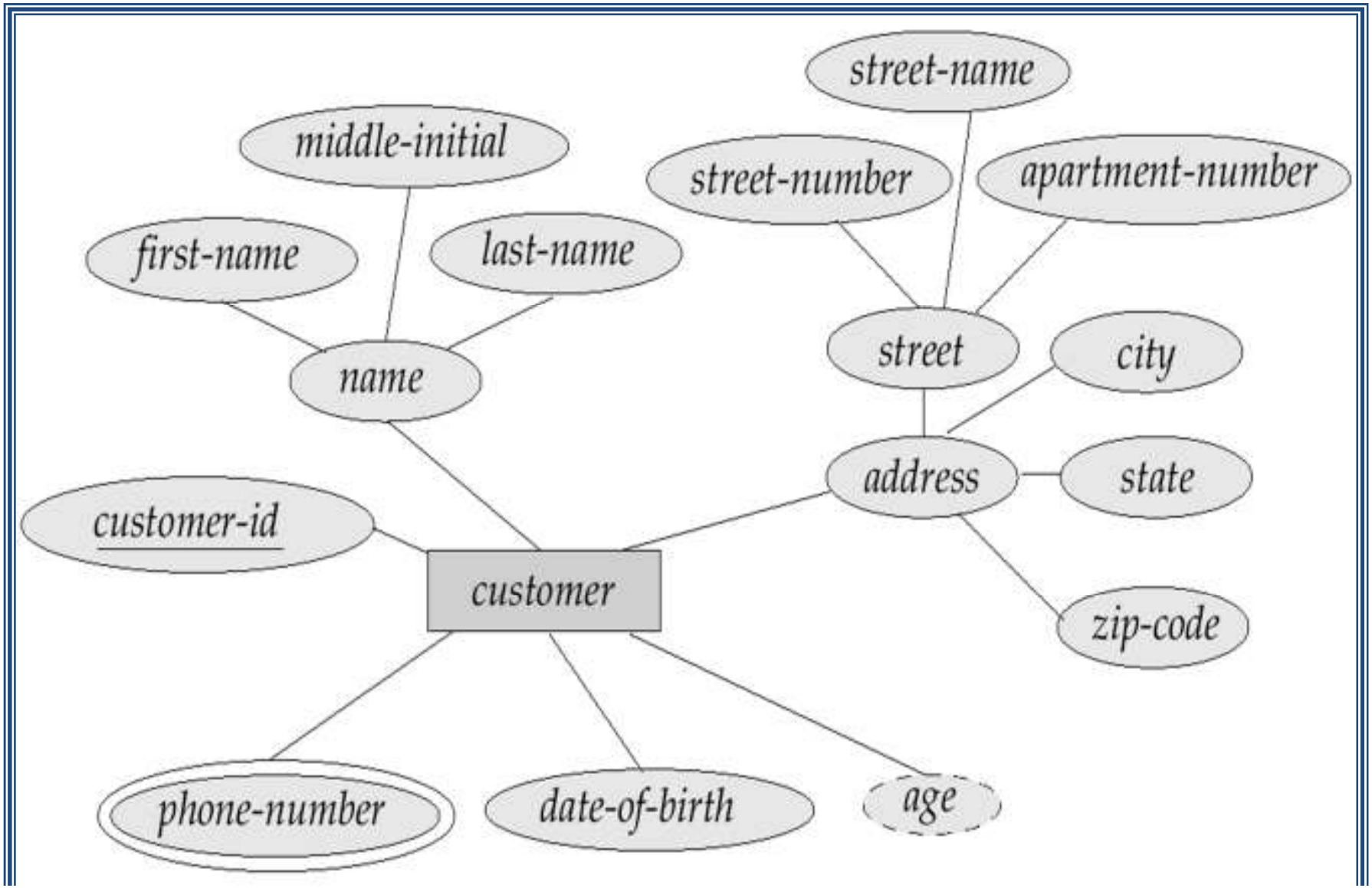
- Age = today's date – date of birth
- Total marks= Midsem_Labmarks + Compre_Labmarks + Midsem_Theory marks+ Compre_Theory marks
- Result = pass / fail depending on total marks
- Sal = no of days * hourly wages
- Annual salary= 12 * monthly salary
- Lib due= no of days exceeded * charge per day
- Notation : dashed ellipse



Types of attributes

- Simple and Composite
- Single valued and Multivalued
- Derived attribute

E-R Diagram with various types of Attributes



Example entity sets

BITS DB

- ❖student
- ❖course
- ❖instructor
- ❖dept

- **student**
  - st_id
  - st_name
  - birth_date
  - gender
  - address

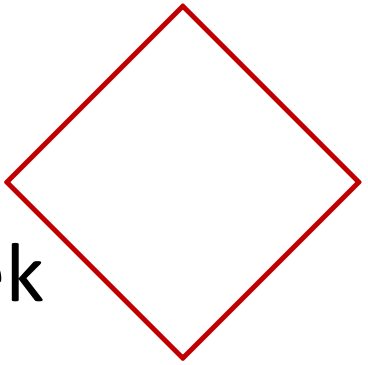
- **course**
  - course_no
  - course_title
  - units
  - l-t-p
  - Sections offered

- **instructor**
  - instructor_id
  - name
  - **dept_code**
  - specialization
  - tel_no

- **dept**
  - **dept_code**
  - dept_name
  - location

RELATIONSHIP AND RELATIONSHIP SET

- Relationship: an association among several entities.
- Relationship set: a set of relationships of same type.



E.g., Abhishek **registers** for DB course

DB course is allocated to Abhishek

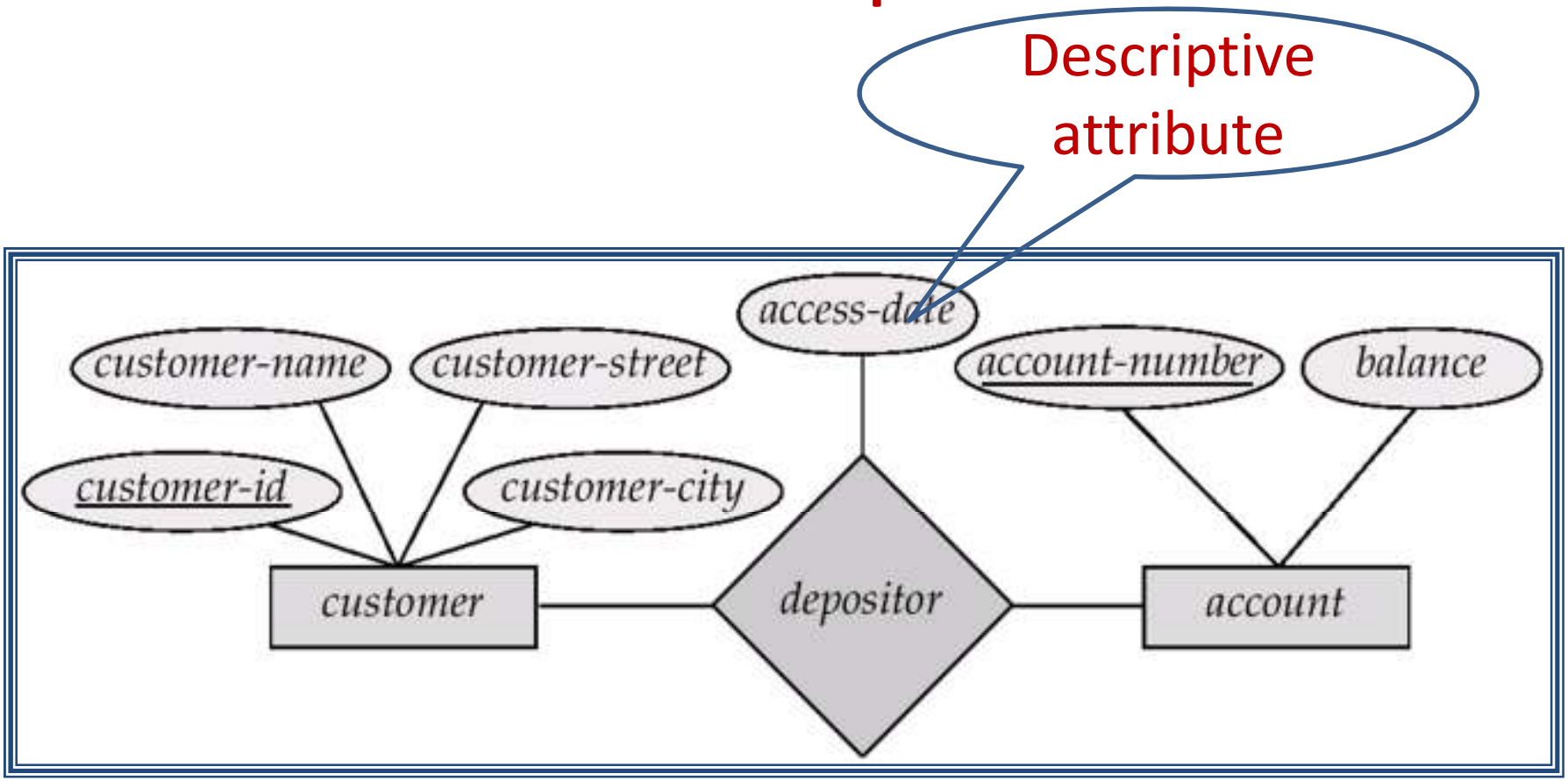
E.g., Customer C1 **holds** an Account A1

Account A1 belongs to Customer C1

E.g., Customer C2 **borrows** a Loan L1

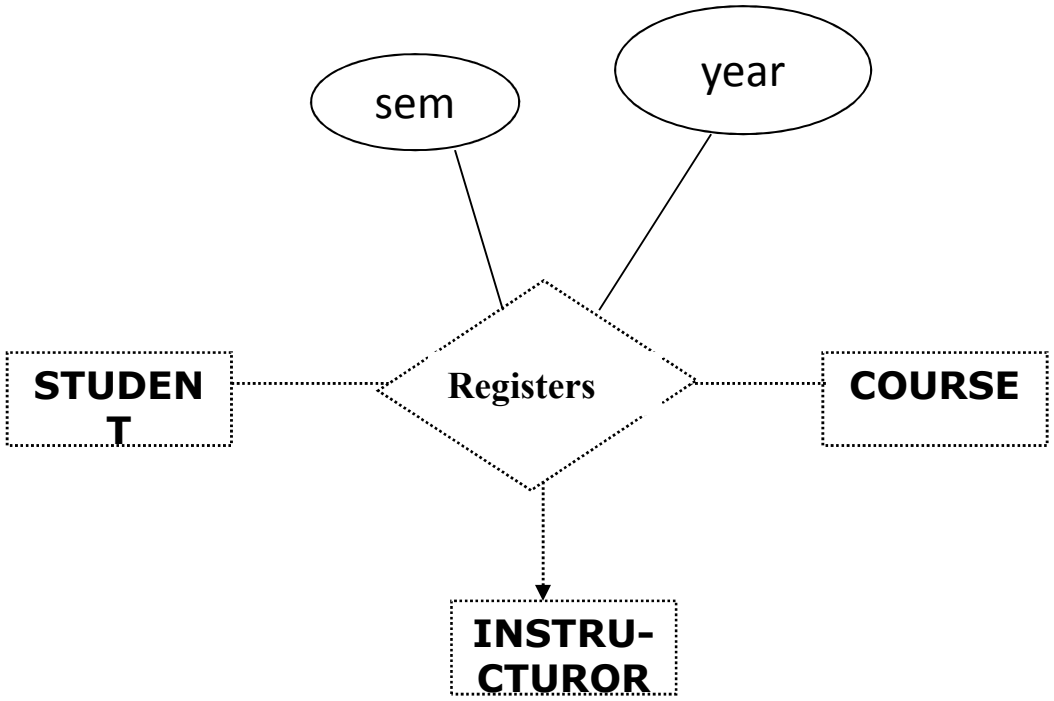
Loan L1 is taken by Customer C2

Example


Descriptive attribute
access-date
customer-name
customer-street
account-number
balance
customer-id
customer-city
customer
depositor
account

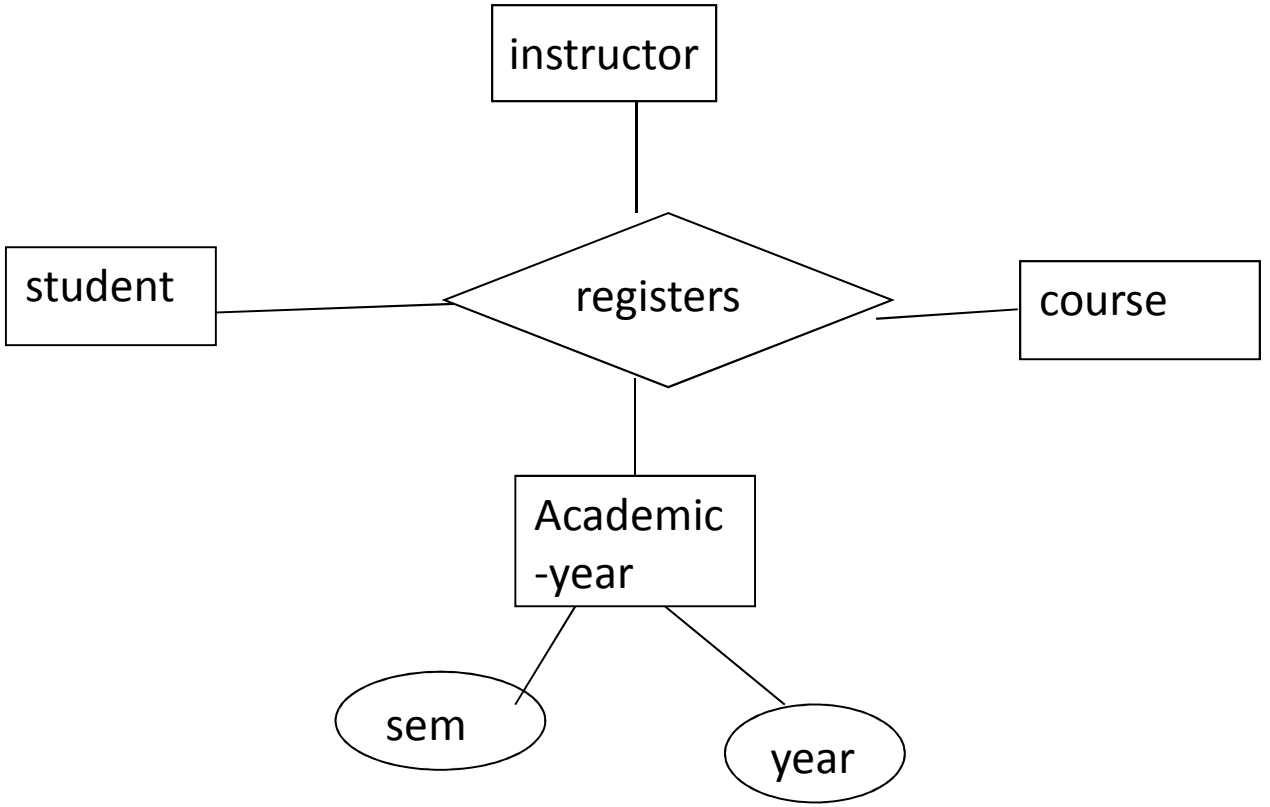
Attributes on Relationships

- Sometimes it is useful to attach an attribute to a relationship.
- Think of this attribute as a property of tuples in the relationship set.



Equivalent Diagrams Without Attributes on Relationships

- Create an entity set representing values of the attribute.
- Make that entity set participate in the relationship.



Degree of Relationships

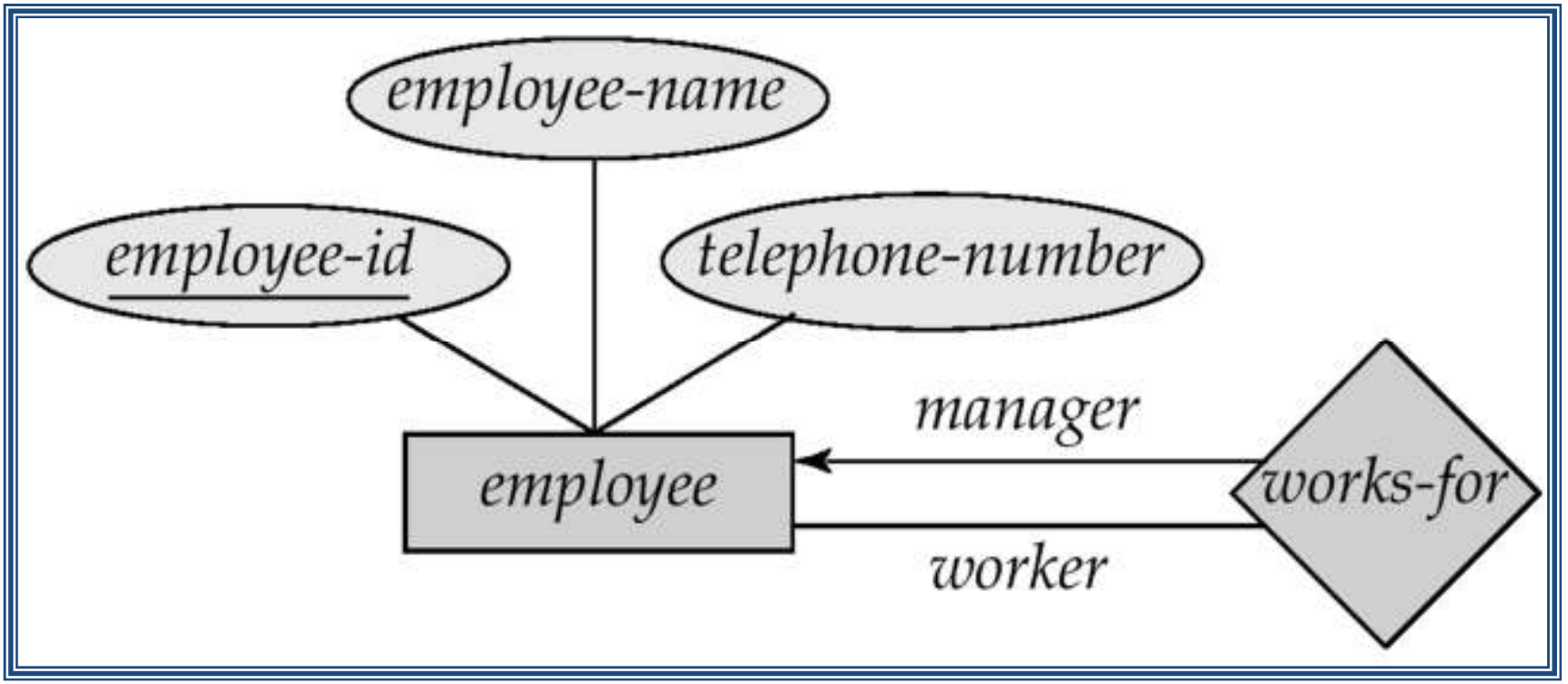
Unary, Binary, Ternary

- **Unary:** A relationship between the instances of a single entity set.

- **Binary:** A relationship between the instances of two entity sets.

- **Ternary:** A simultaneous relationship between the instances of three entity sets.

Example of Unary Relationship



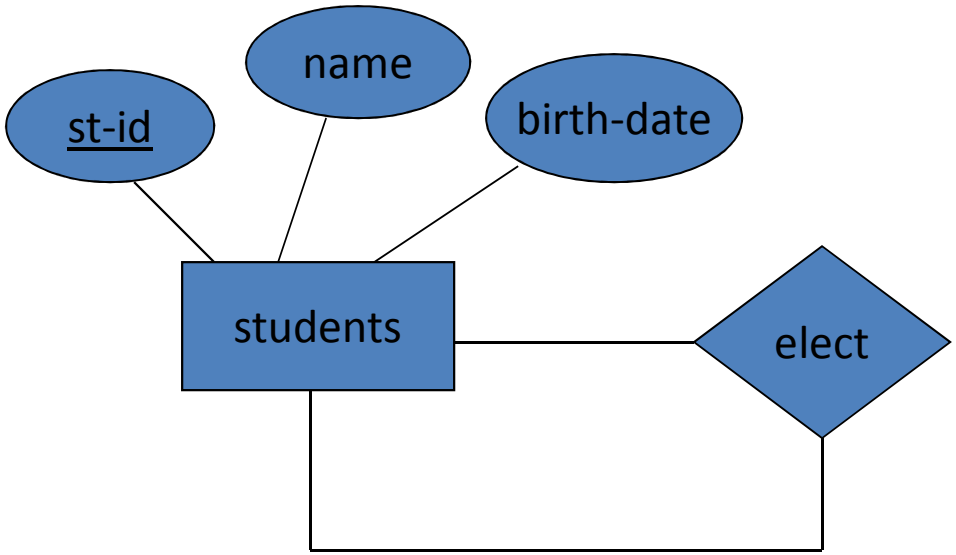
Example of Unary Relationship

- The labels “manager” and “worker” are called **roles**; they specify how employee entities interact via the works-for relationship set.
- Roles are indicated in E-R diagrams by labeling the lines that connect diamonds to rectangles.
- Role labels are optional, and are used to clarify semantics of the relationship
- Also called as **recursive relationship**

Mapping Unary relationship into table

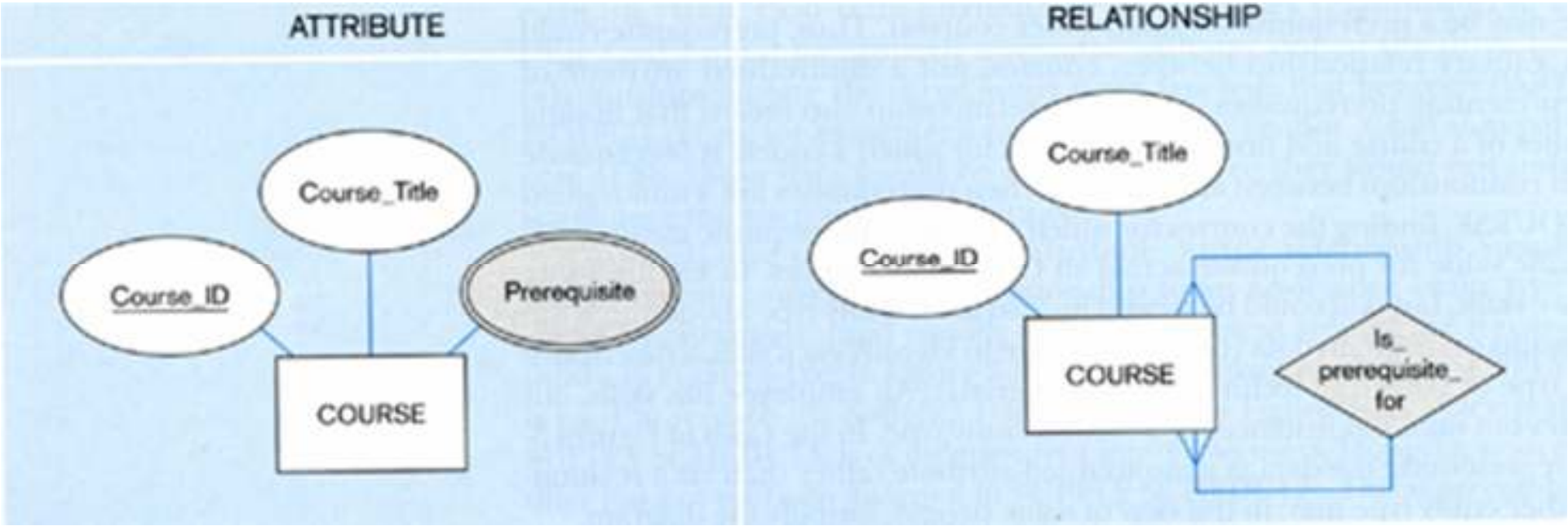
Empid	Empname	Telephone number	Works for
E1	AAA	111	NULL
E2	BBB	222	E1
E3	CCC	333	E1
E4	DDD	NULL	E2
E5	EEE	44	E2
E6	FFF	55	E7 X

Example of Unary Relationship

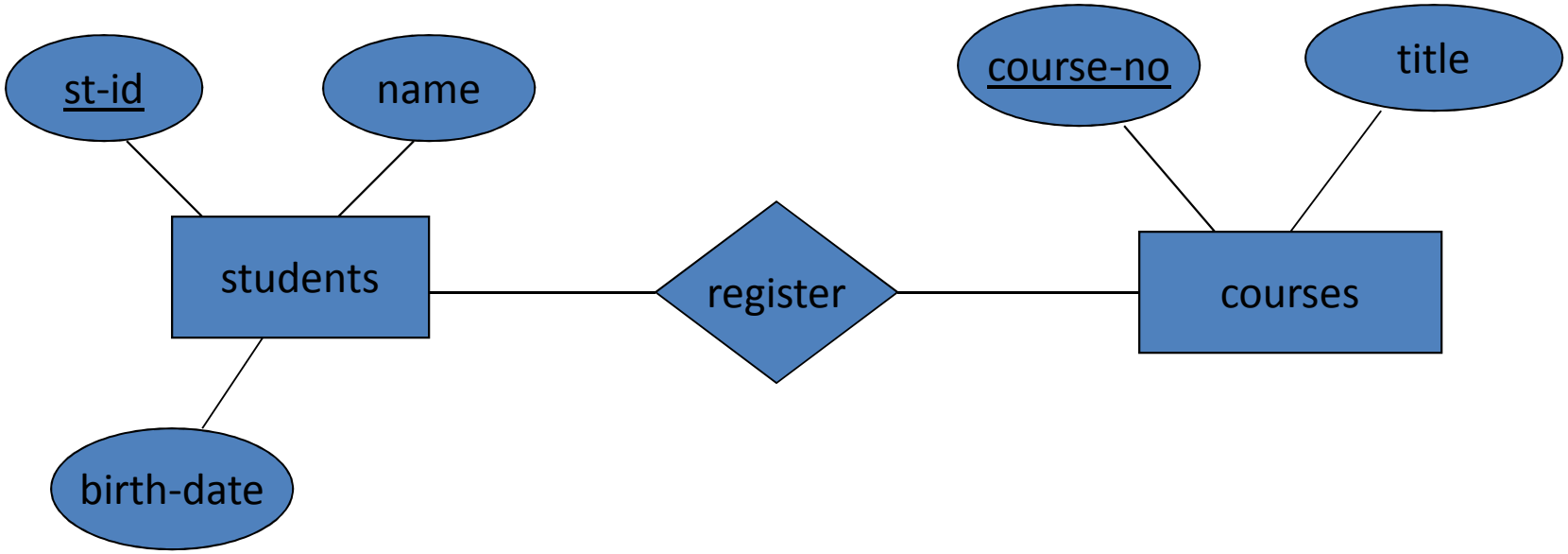


Unary relationship example

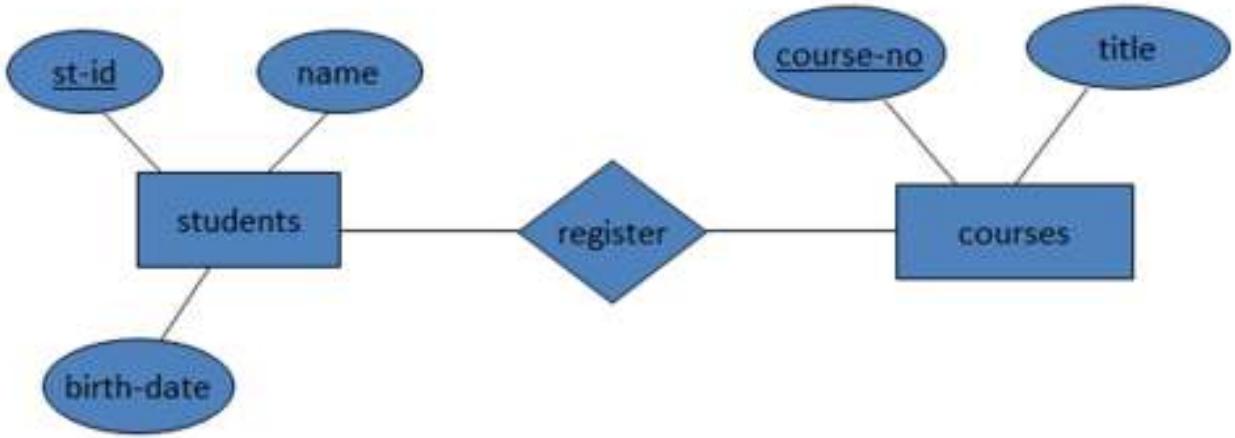
Course	Description	Prerequisite
CIS81	Programming	---
CIS209	VB	CIS81
CIS281	Systems Analysis	CIS 209, CIS330
CIS330	Networks	CIS209, CIS330



Example of Binary Relationship



Mapping binary relation into table

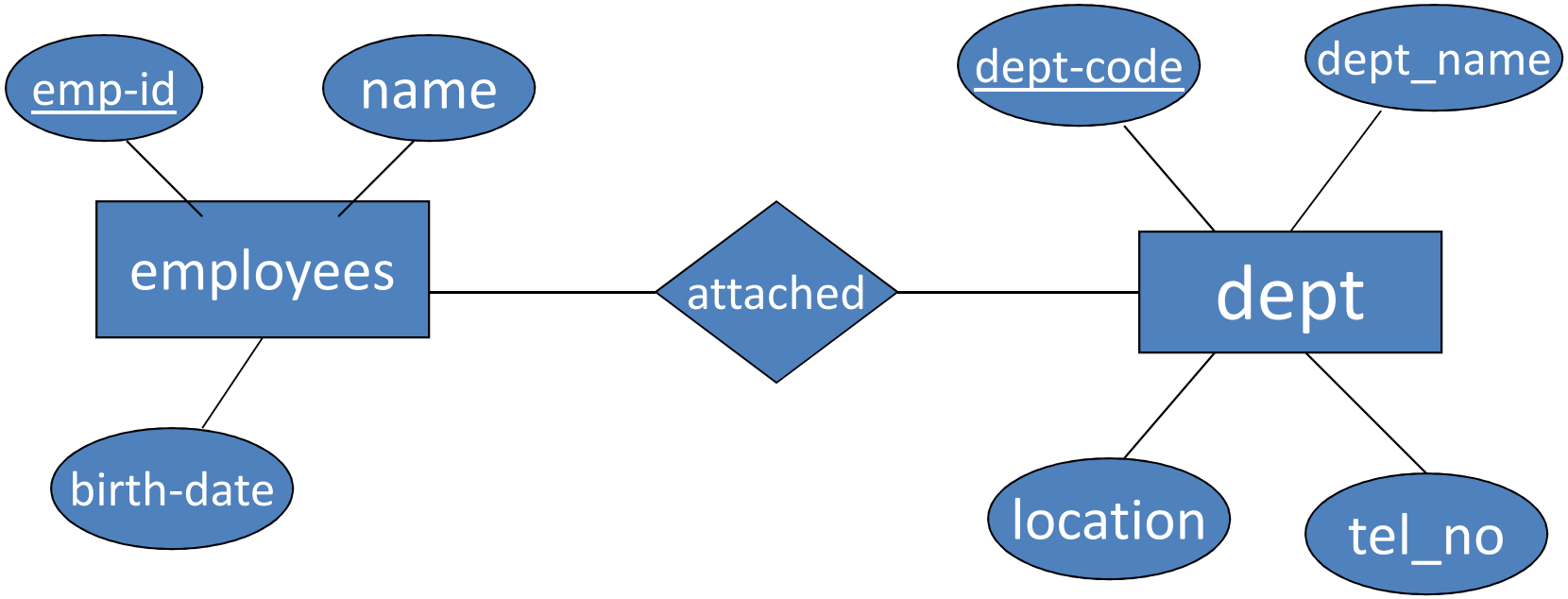


students	St-id	Name	Birth-date

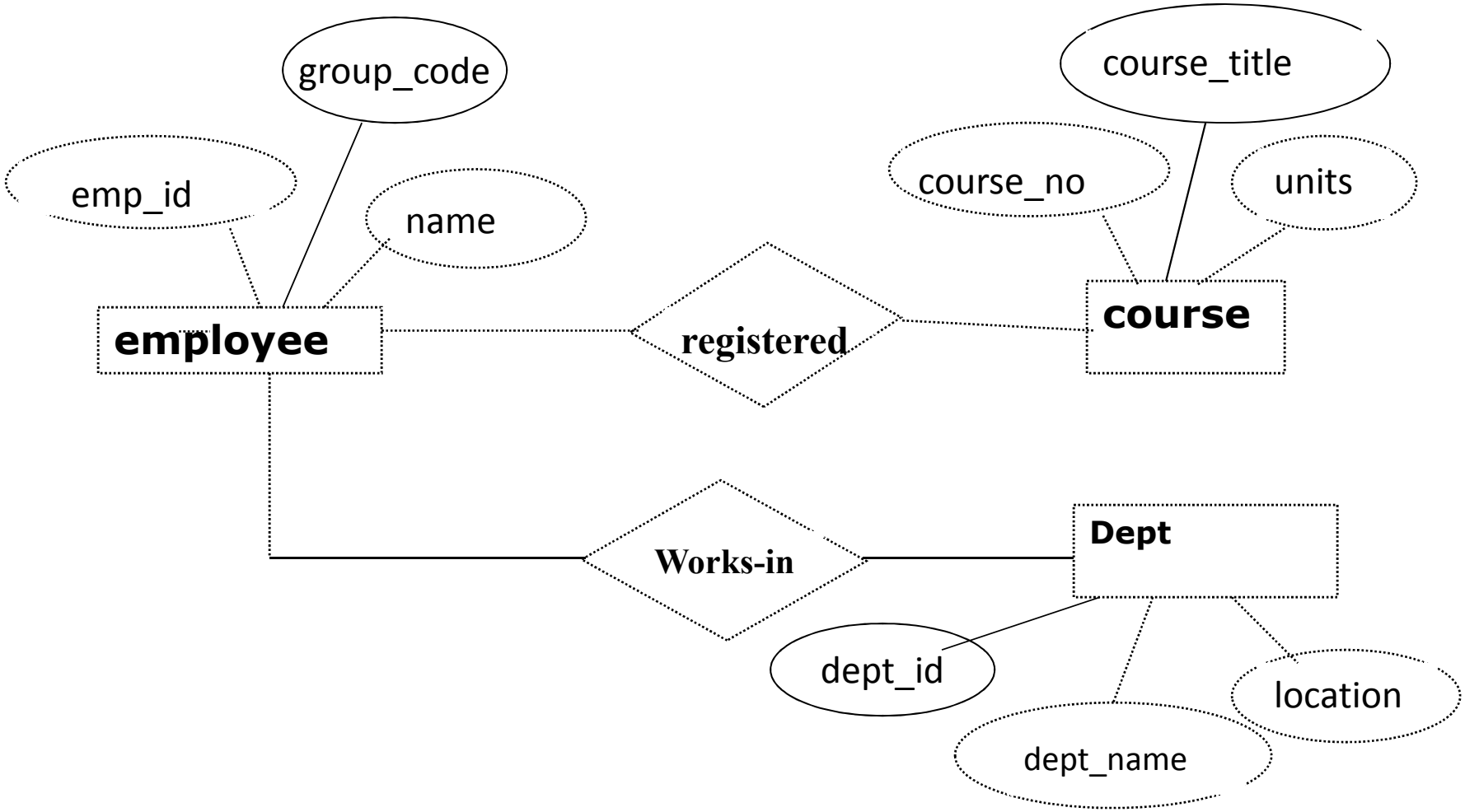
courses	Course-no	title

register	St-id	Course-no

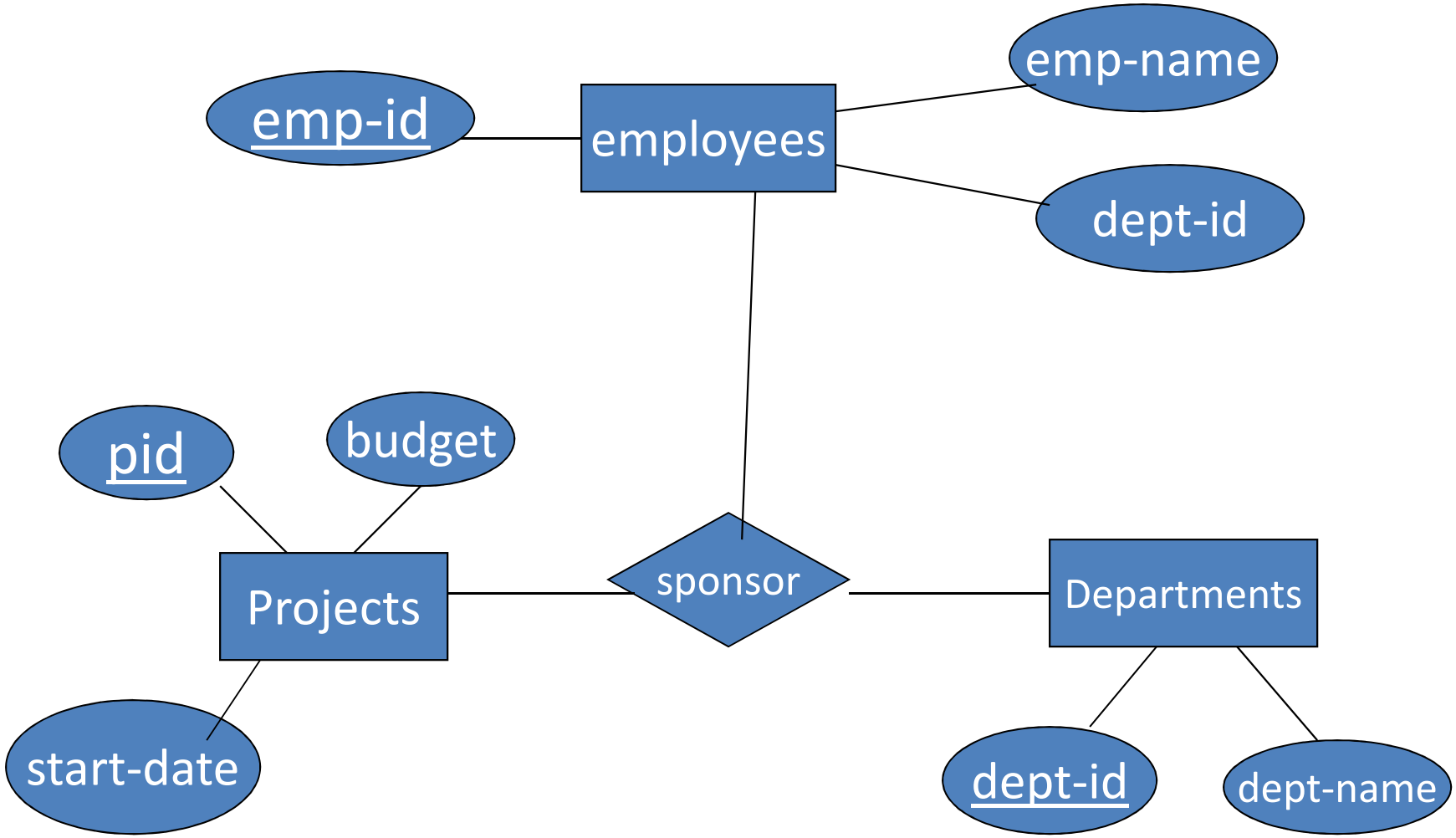
Example of Binary Relationship



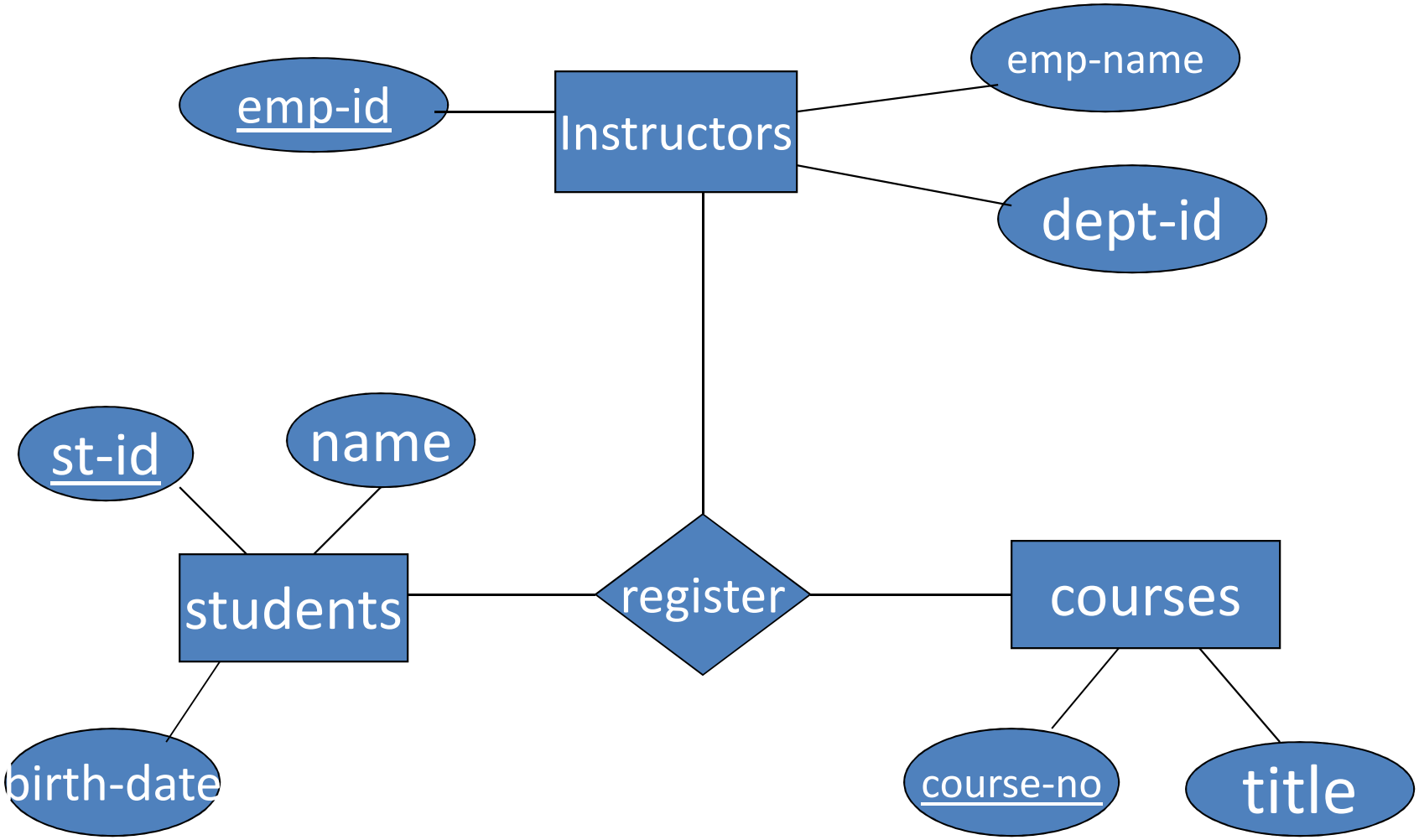
Example of Binary Relationship



Example of Ternary Relationship



Example of Ternary Relationship



Example of Ternary Relationship