#The E-R model should include:

The entities:

**User**

**Student**

**Lecturer**

**Academic Assistant**

**Permissions**

**Dept**

**Course**

**Role**

**Every user has(id,Name)**

.The user can be:

-Student

-Lecturer

-Employee

.Each user has their own

- role

-permissions

>Every student has(id,Name,..)

.Each student belongs to Dep

.Each student has many courses

>Every cours has(id,Name,..)

.Each course belongs to Dep

.Each course taken by students and supervised by lecturer

>Every lecturer has(id,name,..)

.Each lectyrer Belongs to Dep

.Each lecturer superviser many courses

>Eery Dept has(id,Name,..)

.Each dept has their own:

-students

-lecturers

-courses

**>Staff**

* **Attributes:**
  + id (Primary Key)
  + name
  + email
  + contact\_number
  + department\_id (Foreign Key referencing Dept)
  + role\_id (Foreign Key referencing Role)
  + employment\_date
* **Business Rule:**
  + Employees are associated with a department.
  + Employees can have a specific role (e.g., Academic Assistant).
  + Employees may have multiple permissions related to their role.
* **Relationships:**
  + **Belongs to Department (Dept):** Each employee belongs to a department.
  + **Has Role (Role):** Each employee is assigned a role, which governs their permissions.
  + **Has Permissions (Permissions):** Permissions are granted based on the employee's role.

>Role

* **Attributes:**
  + id (Primary Key)
  + role\_name (e.g., Admin, Academic Assistant, Lecturer, Student)
  + description (optional, for further clarification of the role)
* **Business Rule:**
  + Each user (Student, Lecturer, Employee) has one role. The role defines what actions they can perform, based on associated permissions.
* **Relationships:**
  + **Assigned to Users (User):** Each role is assigned to a user (whether they are a student, lecturer, or employee).
  + **Has Permissions (Permissions):** Each role has associated permissions.

>Permissions

* **Attributes:**
  + id (Primary Key)
  + permission\_name (e.g., "view\_courses", "assign\_grades", "manage\_departments")
  + description (optional, for further clarification of the permission)
* **Business Rule:**
  + Permissions define what actions users (students, lecturers, employees) can perform in the system.
  + Permissions are granted based on the role assigned to a user.
* **Relationships:**
  + **Assigned to Role (Role):** Permissions are assigned to specific roles (e.g., Lecturers can have "assign\_grades" permission).
  + **Assigned to Users (User):** Users inherit permissions based on their role.

· **User-Role Relationship:**

* Users (Student, Lecturer, Employee) are assigned exactly one role.
* Role determines the permissions the user has in the system.

· **Role-Permission Relationship:**

* A role can have many permissions, and permissions can belong to multiple roles (many-to-many relationship).