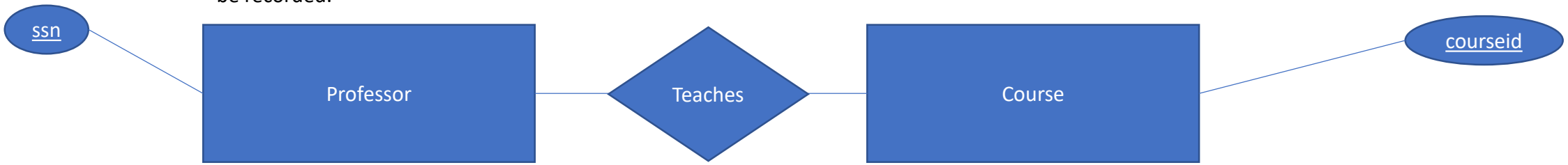
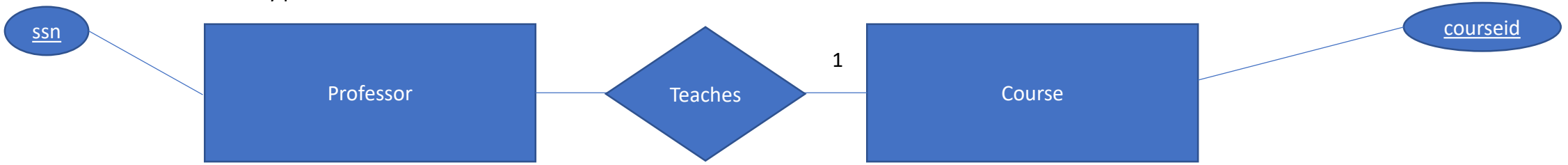
Problem: A university database contains information about professors (identified by social security number, or SSN) and courses (identified by courseid). Professors teach courses; each of the following situations concerns the Teaches relationship set. For each situation, draw an ER diagram that describes it (assuming no further constraints hold).

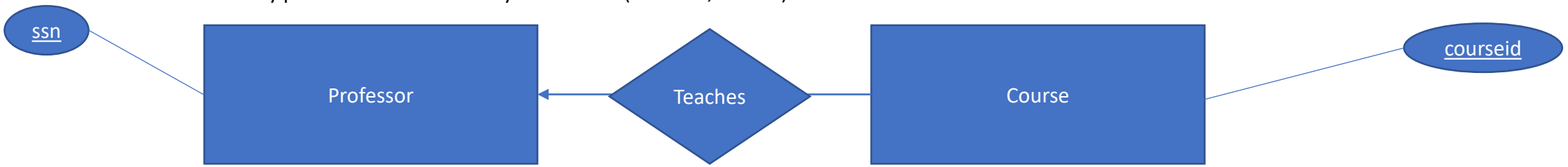
1. Professors can teach the same course in several semesters, and each offering must be recorded.



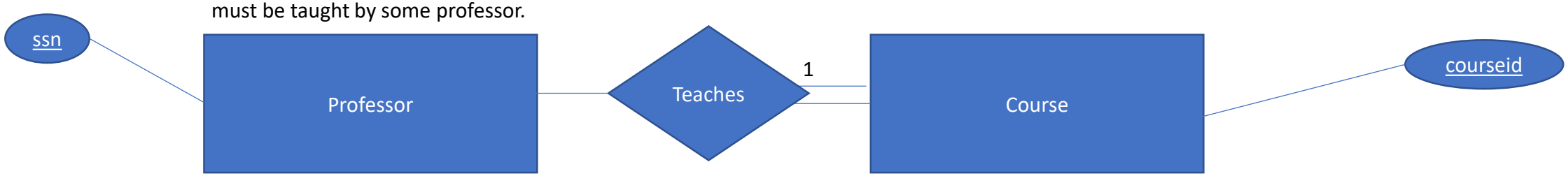
2. Every professor must teach some course.



3. Every professor teaches exactly one course (no more, no less).

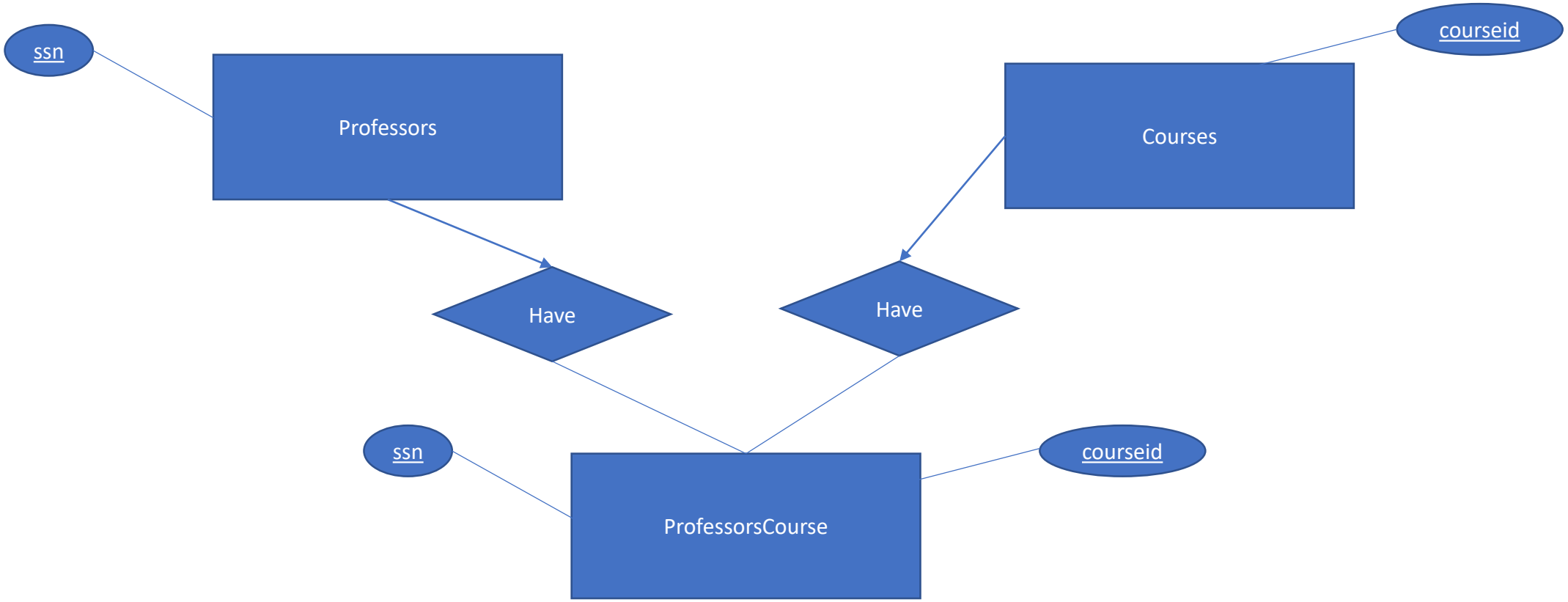


4. Every professor teaches exactly one course (no more, no less), and every course must be taught by some professor.

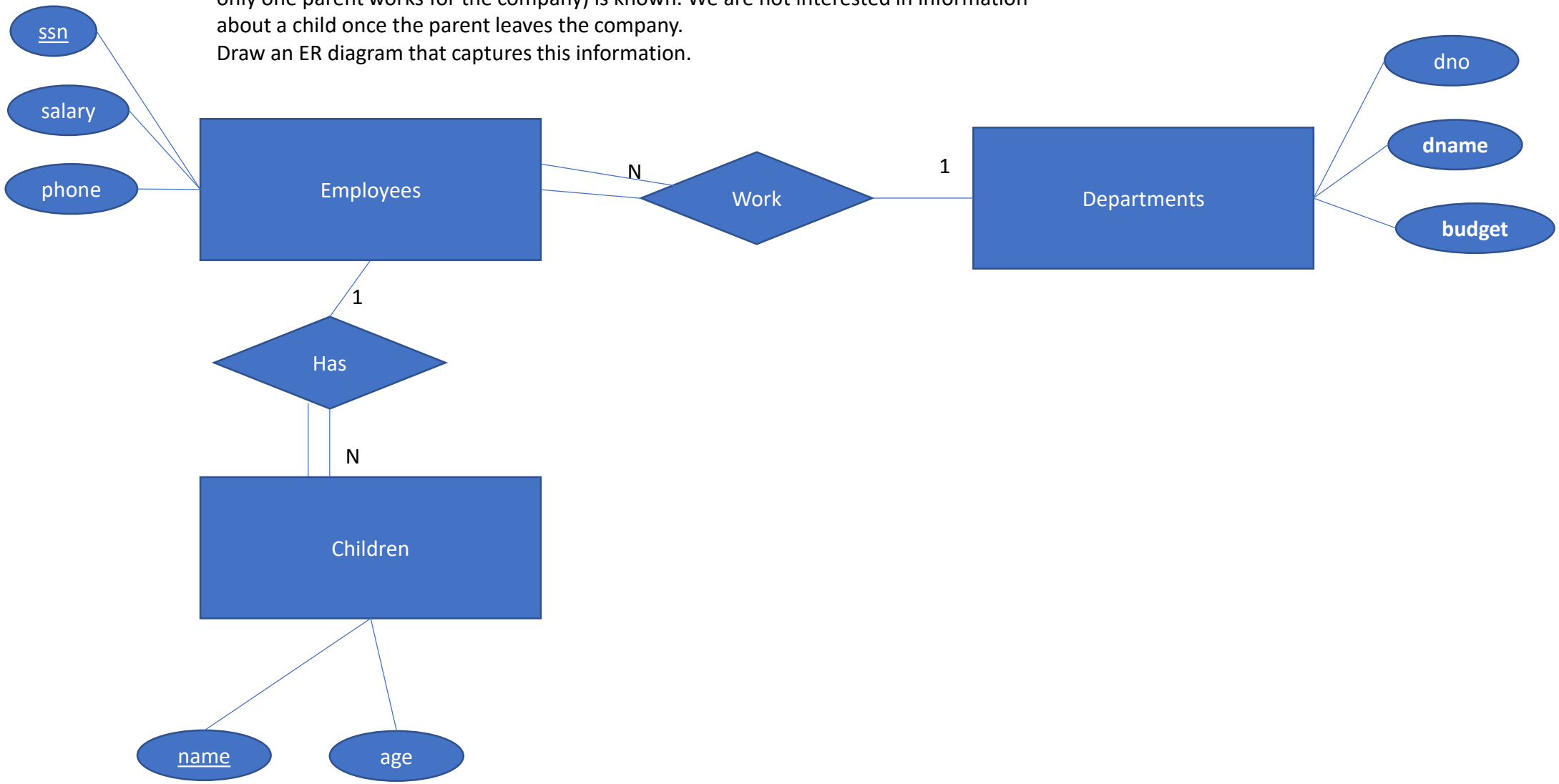


5. Now suppose that certain courses can be taught by a team of professors jointly, but it is possible that no one professor in a team can teach the course. Model this situation, introducing additional entity sets and relationship sets if necessary.

This is roughly, a many-to-many relationship.



Problem: A company database needs to store information about employees (identified by *ssn,* with *salary* and *phone* as attributes), departments (identified by *dno,* with *dname* and *budget* as attributes), and children of employees (with *name* and *age* as attributes). Employees *work* in departments; each department is *managed by* an employee; a child must be identified uniquely by *name* when the parent (who is an employee; assume that only one parent works for the company) is known. We are not interested in information about a child once the parent leaves the company.
Draw an ER diagram that captures this information.



Problem:Design an ER diagram for hospital management system. You have to assume the entities, identify relationships among them, and employ constraints wherever necessary.

This has similar entities and relationships to the previous problem. In addition, showing that a department within a hospital can have many patients and a patient may need to be involved in many departments.