**Class Diagram - Case Studies**

**Case 1**

Students may attend any number of courses.

Every course may have any number of students.

Instructors teach courses.

For every course there is at least one instructor.

Every instructor may teach zero or more courses.

A school has zero or more students.

Each student may be a registered member of one or more schools.

A school has one or more departments.

Each department belongs to exactly one school.

Every instructor is assigned to one or more departments.

Each department has one or more instructors.

For every department there is exactly one instructor acting as the department chair.

**Case 2**

A building is owned by one person.

A person may own more than one building.

Each building is either a house or an apartment.

An apartment contains two or more Rental Units.

It is possible to buy a house, and rent or vacate a Rental Unit

**Case 3**

A company has one or more divisions.

A division has one or more departments.

A company can have one or more persons working as employees.

A person is associated with the company as an employee.

A department can have one or more persons assigned to it.

A person is assigned to one department.

**Case 4**

The library contains books and journals. It may have several copies of a given book. Some of the books can be reserved for short-term loans and others for long-term. Member of library can borrow books. There is a special type of member- Member of Staff, who can borrow the journals. The system must keep track of when books and journals are borrowed.

**Case 5**

A nonprofit organization depends on different types of persons for its successful operation. Three types of persons are of greatest interest: employees, volunteers, and donors. A volunteer works under the supervision of an employee. Employees and volunteers work on various projects organized by the organization. One project consists of many sections. An employee is responsible for writing reports on the project at the completion of the project. To become a recognized donor, a donor must have donated one or more items. An item may have no donors, or one or more donors. Projects and events are also sponsored by sponsors. Sometimes a single project or event is sponsored by multiple sponsors. An event consists of various activities.