1. **Department Management:**
   * The system must be able to manage information about different departments within the university.
   * Each department has a unique name, a building, and a budget.
2. **Instructor Information:**
   * The system should keep track of instructors.
   * Each instructor has a unique ID, a name, and a salary.
   * Instructors are associated with departments.
3. **Student Records:**
   * The system should maintain records of students.
   * Each student has a unique ID, a name, and a total number of credits.
   * Students are advised by instructors and are associated with departments.
4. **Course Catalogue:**
   * The system must manage a list of courses offered by the university.
   * Each course has a unique course ID, a title, credits, and may have prerequisite courses.
5. **Section Scheduling:**
   * Courses are divided into sections.
   * Each section associated with a course has a unique section ID, is associated with a particular semester, and is taught in a classroom.
   * Sections are scheduled at certain times and are associated with time slots.
   * The courses are allocated different time slots.
6. **Classroom Allocation:**
   * The system should manage classroom information.
   * Each classroom has a building name, a room number, and a capacity.
7. **Enrollment and Grades:**
   * Students can take sections of courses.
   * The system must be able to record the grade that a student receives in a course.
8. **Teaching Assignments:**
   * Instructors can teach sections of courses.
   * The system should track which instructor teaches which section.
9. **Time Slot Scheduling:**
   * The system should manage time slots for classes.
   * Each time slot has a unique identifier, a day of the week, a start time, and an end time.

Once the client specifies basic information. Following questions need to be asked and they will be replied.

**Questions Regarding instructor and department**

What is the constraints between instructor and department?

Every department has many instructors and every instructor has to be associated with a department. There are few departments that may not have instructors.

**Questions Regarding Students and Instructors**

How are students related to instructors?

A student can be advised by at most one instructor. An instructor can advise many students. There may be few instructors who don’t advise any student and there may be few students who are not advised by any instructor.

**Questions Regarding Course Catalogue and Prerequisites:**

How are prerequisites for courses managed? Are there courses that have multiple prerequisites?

A course may have multiple prerequisites, and a prerequisite course could be a requirement for several courses.

**Questions Regarding Section Scheduling:**

Can a section have multiple instructors or is it limited to one? Additionally, can an instructor teach multiple sections in the same semester?

Each section is taught by only one instructor, but an instructor can teach multiple sections in the same semester.

**Questions Regarding Classroom Allocation:**

Are classrooms specific to departments or shared across the university? Do classrooms have varying capacities?

Classrooms are shared resources across the university and they have varying capacities.

**Questions Regarding Enrollment and Grades:**

Is there a limit to how many students can enroll in a section? Can students be waitlisted for a section?

Each section has a maximum enrollment limit based on classroom capacity. Students can be waitlisted if a section is full.

**Questions Regarding Teaching Assignments and Time Slots:**

Are there any constraints on time slots for instructors, such as not teaching at overlapping times?

Instructors cannot be scheduled to teach sections that have overlapping time slots.

**Questions Regarding Departments and Courses:**

Can a course be offered by more than one department?

No, each course is offered by only one department.

**Questions Regarding Students and Departments:**

Are students associated with a single department based on their major, or can they be associated with multiple departments?

Students are associated with a single department based on their major.

With these clarifications, the constraints for the ER diagram would be adjusted to reflect the following:

* Courses have a many-to-many relationship with prerequisites.
* Instructors have a one-to-many relationship with sections, without total participation of time slots.
* Sections have a one-to-one relationship with classrooms but a one-to-many relationship with time slots.
* Classrooms have a one-to-many relationship with sections, dictated by classroom capacity.
* Students have a one-to-many relationship with sections up to the section's capacity, with an optional waitlist status.
* Departments offer many courses, but each course is offered by only one department.
* Students are associated with only one department based on their major.