Student Schedule Database Charts

- The following slides give you an example of a context diagram, top level data flow diagram, a second level data flow diagram for one process and an ER diagram. You may want to look at them as well as page 367 through 372 of the textbook.

- These charts would be used to create a database at Southeast or any university for use in the Registrar’s office for creating student class schedules and student grade report cards.
  - A student registers for classes with the Registrar. If there are still seats available, the prerequisites are compared to the student degree audit to see if the student has taken the required courses. If the student has taken the prerequisites, then the student is allowed to enroll, if not, the student is denied enrollment in the course.
  - If the student is enrolled, the course roll is increased by one. The student takes the course and a grade will be assigned at the end of the semester.
  - The student’s degree audit gets updated and the student gets a grade report.
Context Diagram

Represents the overall system and its interaction with its environment.

- **Student**
  - Registers for class
  - Assigns classes
  - Sends Schedule
  - Sends Grades

- **Registrar**
  - Checks to see if student is in Financial good standing

- **Financial Aid**
  - Checks to see if student is in Financial good standing

- **Bursar**
Brief Overview of the Context Level Diagram
(you will want to provide more detail)

To register for classes at Southeast, a student completes an online form which is submitted to the Registrar Office’s system. The system checks to see:

- if the student is a registered Southeast student,
- if the student is financially eligible to take classes with the Financial Office,
- if the student has the prerequisites for the class,
- and if there are still available seats left in the class.

• (Most of the previously mentioned steps occur internally within the Registrar’s Office.)

• From the diagram, you can see that the Registrar’s Office checks with Financial Aid to verify financial eligibility (has not defaulted on a student loan). If the student is eligible, then the registration process continues, if not, the student is informed of his/her ineligibility.

• The Registrar Office checks with the Bursar’s Office to make sure that the student does not have any other outstanding bills that would prevent the student from registering for classes.

• If the students meets all of the above requirements, the student is registered for the class and sent their class schedule, if one of the requirements above is not met, then the student is denied registration in the class and notified of the denial. At the end of the semester, the student is sent their grade report.
Data Flow Diagram (Level 0)

1. Course Request → Course Approved 1.0
2. Prereqs → Course Approved 1.0
3. Degree Audit → Course Enrolment Increased 2.0
4. Course Roster → Course Enrolment Increased 2.0
5. Student Schedule → Grade Updated 3.0
6. Grade Report → Grade Updated 3.0

Grade Book
Brief Overview of the Data Flow Level O Diagram (you will want to provide more detail)

• A student, who is external to the system, requests courses for his/her next semester schedule.
• Once the Registrar’s Office receives the request:
  – The Registrar’s Office checks the course prerequisites
  – The Registrar’s Office checks the student’s degree audit to see if the student has taken the prerequisites. If he/she has, the process continues. If the prerequisites have not been met, the student is ineligible for registration.
  – The Registrar’s Office checks to course roster to see if there are still available seats left in the class.
  – If the student has met the prereqs and a seat is available, the student is enrolled in the course, the available seat count for the course is decreased by one and the course is added to the student’s schedule.
  – At the end of the semester, the teacher of the course assigns a grade to the student’s work, the student receives a grade for the course, the student’s degree audit is updated with the grade for the course and the student can download a copy of his/her grade report for the semester.
Data Flow Diagram (Level 1) for Process 1.0

Course Request

Verify Seat Availability 1.1

Obtain Course Prereqs 1.2

Course Description

Degree Audit Requested 1.3

Comparison Of Prereqs Degree Audit 1.4

Degree Audit

D1

D2

D3

D4

Student Denied Enrollment

Student Enrolled in Course
In order to determine whether or not the student is eligible to take the course, there are several steps that must take place in the course approval process after the course is requested by the student:

- If the course is full, the student can not be considered for the course. (The student will have to place his/her name on the waiting list, which is outside the scope of the project.)
- The course prerequisites will need to be obtained from the course description.
- The student’s degree audit will need to be obtained.
- The degree audit will then need to be compared to the required prerequisites to see if the student had the appropriate prerequisite level courses to take the course.
- If the student has taken the prerequisites, the student is enrolled in the course.
- If the prerequisites have not been met, the student is ineligible for the course at this time and is denied enrollment into the course.
ER Diagram

Legend:
>l = 1 or many
|| = 1 and only 1
Brief Overview of the Entity Relationship Diagram
(you will want to provide more detail)

• When reading an ERD, you read from left to right, then from right to
  left then top to bottom and then bottom to top.
• Reading from left to right:
  – A student can live at one or many addresses (at the University, a
    student can have up to 8 different addresses: local, permanent, spring,
    summer, winter, fall, billing, emergency)
  – An address belongs to one and only one zip code. Thus, when you write
    your return address on a letter, you do not have multiple zip codes to
    chose from, only one.
• Reading from right to left:
  – A zip code can contain one or many addresses (Most zip codes contain
    many addresses, think of your hometown. However, there are a few
    places that only have one address. Considering how much land Ted
    Turner owns in Montana, there are probably areas in Montana that only
    contain one address.)
  – An address can house one or many students. (A person can live alone
    or a person can have roommates.)
Brief Overview of the Entity Relationship Diagram (you will want to provide more detail) –cont.

• Reading from top to bottom:
  – A student can have one or many schedules over the course of their college education (if the student drops out after only one semester, he/she will only have 1 schedule for that semester, however, most students will have at least 8 or more schedules with one for each semester of attendance)
  – A schedule can contain one or many classes depending upon the number of courses a student takes in a semester. (The student must take one course to have a schedule.)

• Reading from bottom to top:
  – A class can contain one or many students. A student can enroll in an independent study or, like with our class, there are close to 30 students enrolled.
  – A schedule belongs to one and only one student. Although there may be other students who, by chance, have the same schedule, each schedule is created individually for each student.
Brief Overview of the Entity Relationship Diagram 
(you will want to provide more detail) –cont.

• Reading from left to right
  – A scheduled course in a semester is taught by one and only one instructor. (We make the assumption that no courses are team taught.)

• Reading from right to left:
  – An instructor can have one or many schedules over the course of their teaching career (if the instructor quits after only one semester, he/she will only have 1 schedule for that semester, however, most instructors will have several semesters of work over the lifetime of their career)