Part 1

**Undergraduate C442 and Undergraduate I451 Students:**
Develop SQL statement for the following queries. For each query, explain your strategy for attacking and solving the problem. Discuss any specific SQL clauses that were critical in allowing you solve the problem. Note that these queries are a subset of the queries developed in assignment 4 and you may have already developed some of these queries. However, these queries require that you first develop a good understanding of degree requirements for the BS in Physics. Then you must enter the Physics degree requirements in the appropriate tables, and then finally run your queries and verify the results. As you prepare your queries you may discover some errors in the queries which you submitted for assignment 4. Clearly document those errors and explain how you were able to correct them.

- **Q1:** Show the Physics Courses and their Prerequisites/coreq/equiv etc. (show the subject area, course number (not course id), course title, the relationship (prereq, coreq, etc.), followed by the prereq/coreq, subject area, course no and course title.

- **Q2:** Display ALL the Basic Degree Requirement Categories (even those that are not required by BS in PHYS), and Show which categories, have a corresponding requirements for the BS in PHYS and which ones do not. The ones that do not have a corresponding PHYS requirement will appear as NULL values in the PHYS column. (Hint, think LEFT JOIN)

- **Q3:** DISPLAY THE DEGREE REQUIREMENTS (DegreeID, RequirementText, Detailed RequirementText) for BS in PHYS. (Consult 2007-2009 Bulletin)

- **Q4:** DISPLAY the Degree requirements for BS in PHYS and the courses that satisfy them. (DegreeID, RequirementText, Detailed RequirementText, courses which satisfy that requirement). (Consult 2007-2009 Bulletin)

- **Q5:** Print the Transcript for Studentid = 3000 (a physics student who has taken at least 10 courses during 3 semesters)

- **Q6:** Print the Degree Audit for Studentid = 3000 (a physics student who has taken at least 10 courses during 3 semesters)

**Graduate C442 and graduate A505 Students:**
Develop SQL queries for the following 7 queries. For each query, explain your strategy for attacking and solving the problem. Discuss any specific SQL clauses that were critical in allowing you solve the problem. You should have your queries (as well as any needed data) available in electronic form, so that you can present them in class. I will ask you to present 2 or 3 of your queries.

**Database Queries:**

- **Q1:** Display the Degree Audit for StudentID 1000. (Hint: Left join)

- **Q2:** Display the Number of Credits Completed by StudentID 1000, for each Degree Requirement Category. (Hint: Aggregate functions, group by, left join)
Q3: Show the (EXPLICIT and IMPLICIT) prerequisites for CSCI-C 435. Explicit prereqs are those that are explicitly specified in the database. Implicit prereqs are those prereqs that are derived by recursively or interactively finding all the prereqs of the EXPLICIT prereqs. (Hint: Temporary Relations)

Q4: List all the students (student id, name and phone, and their major) who have successfully completed CSCI-C 101 (or its equivalent courses) but have not declared a major in Computer Science or Informatics.

Q5: Part-1 List all the students (student id, name and phone, email) who have successfully completed the prerequisite for C311. (C234, C335).

Part 2- List all the students (student id, name and phone, email) who qualify for an AS in computer science.

Q6: Part-1 List ALL the CS students and ANY advising information that they may have. (Note all the CS students must be included in the query. Even those that don’t have any advising information.)

Part-2 List the CS students who have NOT been advised for more than six months. Sort your output based on Student Last Name, followed by First Name.

Q7: Display the degree requirements for the MS in Applied Mathematics and Computer Science. (Before you can complete this query, you have to first determine how the degree requirement data for this degree program should be entered into the system.)

Note: You should put sufficient amount of data in your database, so that you can properly test your queries.

Part 2
Review and apply 1st, 2nd and 3rd normal forms to all the tables in the ADVISE schema. Show any tables that do not comply with normal forms and explain how they should be modified in order to comply with normal forms.

What to hand in:

- Cover page (title, name, course # and name, assignment #, date)
- Analysis of each query.
- Description of any errors found in queries submitted in assignment 4, and the new SQL statement which resolves the problem.
- Identification of any tables that do not comply with 1st, 2nd and 3rd normal forms, and your solution.