1. Course Information

Instructor:
Dr. M.E. Fayad
Computer Engineering, College of Engineering, San Jose State University
Web page: http://www.engr.sjsu.edu/fayad

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Advanced Database Design</th>
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<tbody>
<tr>
<td>Course Code</td>
<td>CmpE 226</td>
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<tr>
<td>Section</td>
<td>1</td>
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<tr>
<td>Class Hours &amp; Location</td>
<td>Wednesday 6:00 p.m. to 8:45 p.m. (18:00 to 20:45) Clark Bldg Room 222</td>
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</tbody>
</table>
| Office Hours         | Monday: 3:15 p.m. – 5:45 p.m.  
                        | Friday: 3:15 p.m. – 5:45 p.m.  
                        | Other times: Send an e-mail to schedule an appointment. |
| Office Location      | ENG 2831                 |
| Office Phone         | (408) 924-7364           |
| E-mail:              | m.fayad@sjsu.edu         |
| Preferred Contact    | Through e-mail           |
| Department Fax       | (408) 924-4153           |
| Course Web Page      | http://www.engr.sjsu.edu/~fayad/current.courses/cmpe226-spring2015 |
2. Course Description

a. Course Overview and Description:

<table>
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<tr>
<th>Course Catalog Description</th>
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<tr>
<td>Database concepts and architecture. Logical and physical data organization. Relational, hierarchical and network databases. Security/integrity, recovery/concurrency. Design projects.</td>
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This course develops your understanding of database system CONCEPTS that are independent of any specific database system. As an analogy, if you took a driver’s education class, you learned there driving, which is independent of any specific car. This distinction between concepts and tools is important to keep in mind in this course (especially by students who like to list on their resumes a long list of specific operating systems, programming languages, and database systems).

These concepts include: data abstraction levels; data independence; data models, including relational, constraint, spatial, and spatiotemporal data models; query languages, including relational algebra, and SQL; database design concepts, including integrity constraints; and interoperability, including data and query interoperability. Many of these concepts have a remarkable staying power, while the specific systems change all the time. In fact, the more basic the concept the more likely it is to endure. For example, the concept of data abstraction endured even as new data models were invented: hierarchical in the 1950s, network in the 1960s, relational in 1970, and various spatial data models used in GI in more recent years. As another example, the QL language, invented in the early 1970s, is still the primary language of relational database systems today, whether they come from Oracle, IBM, Microsoft, MySQL, ybase, Empress, etc.

By understanding well the concepts and not just a specific system on a specific platform, you should be able to adjust better to future changes in the database systems area. In particular, GI is emerging as a very important extension of relational databases, with some estimates putting the word-wide GIS market at about one billion dollars annually, while the relational database market is about six billion dollars annually. Hence we will learn about GIS too in this course. This course will contain two or three projects that are designed to illustrate a variety of uses of database systems (all subject to change):

b. Prerequisites:
CmpE126/CS046B (Algorithms & Data Structures), or CmpE 200 (Computer Arch.) or Instructor Consent -- Good background in the practical use of an object-oriented programming language is a plus.

c. Required & Recommended Texts:
Any book is fine. You can count on the information that I provide for you on the website.
d. Other Reading Materials:

Supporting Texts:
   Chapters: 1, 3, 7, 8, 11, and 12
   Chapters’ sections of 2, 4, 19, 21, and 26.
   ** Good notes will be provided for the above chapters.

Required Articles, Columns, Case Studies, and Patterns will be posted on the web later.

Other Resources: Instructor notes will be available on the course web page.

e. Student Learning Objectives:

On Successful completion of this course students shall be able to:
1. Model and design conceptual databases using Entity-Relationship model, the traditional and stable class diagrams
2. Understand and apply the relational algebra and SQL
3. Learn and work on database issues, such as normalization and security
4. Explore and examine database current trends, such as Constraints Database, Spatiotemporal Database, Data Visualization, and Data Animation
5. Explore and learn database emerging trends, such as web technologies, XML, data warehousing, and data mining

3. Course Requirements

a. Projects

Projects are team-oriented. The class will be divided into groups of 4-3 (three preferred) for team projects. Students will be responsible for forming groups. Students of the best 3 or 4 teams’ projects will give final presentations of their project work if asked. Grading criteria and project ideas will be posted in a project Web page.

Teams are responsible for two projects and the third project is optional for extra points. Team must deliver if they select project #3 otherwise each team member will be penalized for 4 whole points each.
**Project 1:** This project will focus on database modeling and design using UML Class Diagram and Normalization.

**Project 2:** This project will focus on relational databases and SQL. For this you can use either the **MLPQ system**, which was developed at UNL. In this project, each team will be allowed to select one project out of many that are related to constraint database. MLPQ system will be used in this project.

**Project 3 (Optional):** This project is an advanced project and is based on stabilization of data using **enduring concepts and business objects**. It will focus on web accessible databases. You need to set up a webpage with **embedded SQL** queries that can remote access an Internet database.

On occasion, students take advantage of group work, letting other members perform the bulk of the work while they reap the benefits of a good grade and can spend more time on other classes. This happens only occasionally, but it will not be tolerated in this course. Two policies will help prevent this:

1. **Twice** during the semester, group members will be asked to fill out a detailed peer assessment for group members per project. Penalty will be assigned for no peer assessments. This assessment will be based on four scales:

<table>
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<tr>
<th>Assessment</th>
<th>Meaning</th>
<th>Correspondence</th>
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<tbody>
<tr>
<td>Zero</td>
<td>Doesn’t do anything</td>
<td>Get a Zero on the project</td>
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</table>
| D          | • 25% effort  
• Attends 25% of the meetings  
• Doesn’t participates in the discussion  
• Does a poor job | Get a 25% of the project’s grade |
| C          | • 50% effort  
• Attends 50% of the meetings  
• Participates rarely in the discussion  
• Does a so-so job | Get 50% of the project’s grade |
| B          | • 75% effort  
• Attends 75% of the meetings  
• Participates partially in the discussion  
• Does an okay job | Get 75% of the project’s grade |
| A          | • 100% effort  
• Attends all the meetings  
• Participates effectively in the discussion  
• Does an excellent job | Get 100% of the project’s grade |

**Merely attending meetings won't be enough.** Group members must be prepared for meetings, make good suggestions, perform their share of the work, and work well with other members.

The grading criteria for peer assessment is as follows:
a. Has the group member attended meetings?
b. Has the group member been prepared for group meetings? I.e. was he/she aware of assignment requirements, performed her/his duties, able to speak intelligently about the project, etc.?
c. Has the group member participated positively in meetings?
d. Has the group member performed their share of the work, as assigned?
e. Rate the quality of this group member's input to group discussions and design issues.
f. Has the group member been able to work well with others?
g. Rate the overall value of this group member to the project.
h. Rate the level of initiative this group member has exhibited in the project.
i. Other comments?

2. Groups experiencing problems with a student should let me know there's a problem. Do this early in the semester. My experience is that group members wait until it's too late to take action. My objective is to ensure that each group member has the opportunity to succeed. I will handle the situation and ensure there is no animosity while resolving the problem. Usually, a brief discussion will clear the matter up entirely and without further problems.

b. Exams: Two midterm exams of equal weight (see grading). There will be no make up tests.

c. Class Attendance & Participation:
Important: Class attendance is mandatory. If you have more than four unexcused absences, then you will be dropped from the class.
d. Essay – Check essays’ requirements
e. Practical Problems – Check practical problems’ requirements
f. Extra Assignments – Check extra assignments’ requirements

4. Tentative Course Calendar:

a. Weekly Schedule - - See weekly schedule on the course webpage

b. Due Dates:
Important: Late extra assignments and team projects are NOT ACCEPTABLE. In this case, the grade of any late extra assignments or any late projects will be assigned a “zero” mark. See Due dates on the course webpage
5. Grades:

a. Grading Policy
Your grade in this course will be based on your performance on written homework, test, and a programming project.

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<tr>
<td>Midterm</td>
<td>15%</td>
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<tr>
<td>Final</td>
<td>25%</td>
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<tr>
<td>Team Project (1)</td>
<td>25%</td>
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<tr>
<td>Team Project (2)</td>
<td>25%</td>
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<tr>
<td>Individual Assignment</td>
<td>10%</td>
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<tr>
<td>Total</td>
<td>100</td>
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Extra Points*

*Extra Points include Practical Problems, Essays, and Extra Assignments.

Your grade will be based on an overall curve.

Final Grades:
Letter grades will be assigned at the end of the course. Final grades will be based on a competitive curve. Graduate and undergraduate students are graded separately. Students will be informed of their standing at intervals throughout the course. Final grades are not negotiable. Unless there are mathematical errors, I will be unavailable to discuss final grades. Borderline cases will be considered with extreme care, and fair grades will be rendered.

b. Extra Credit Options:

1. Practical problems (all) solutions must be submitted on time with good effort will be graded for whole 2 1/2 points.
2. See Project #3 (Optional) Individual or team project, if completed on time, it will be graded for whole 10 points.
3. An Essay will be graded for whole 2 1/2 points.
4. An Extra Assignment will be graded for whole 2 1/2 points.

c. Penalty for Late or Missing Work:

1. No credits for late extra assignments
2. No credits for late team projects
3. If you sign for project #3 and don’t deliver, you will be penalized for 5 whole grade points.
4. No credits will be given for late submission of practical problem solutions and essays
5. If you sign for an essay or extra assignment and don’t deliver, you will be penalized for 2 1/2 whole grade points.
6. If you fail to submit any of the team evaluation or any dishonest evaluation, you will be penalized for one (1) whole grade point.
7. Failure to use the submission guidelines three times, you will be penalized for a one (1) whole grade point and block your name from the electronic mails.

As an instructor, I have the right to add to or delete any of penalties above and I will let you know before doing so.

6. University, College, or Department Policy Information:

a. Policy on Cheating:
   • A student or students involved in a cheating incident involving any non-exam instrument (homework, extra assignments, practical problems, reports, or team projects or individual projects) will receive an F on that instrument, and will be reported to the judicial affairs office. Whether the report will carry a recommendation for disciplinary action will be left to my judgment.
   • A student or students involved in a cheating incident on any quick test, the midterm exam or the final exam will receive an F in the course, and will be reported to the judicial affairs office with a recommendation for disciplinary action.

I will personally notify you of any such findings or actions. All such reports will also be brought to the attention of the computer engineering department office. You have certain rights of appeal, which may serve to exonerate you.

Check:

Academic integrity statement (from Office of Judicial Affairs):
“Your own commitment to learning, as evidenced by your enrollment at San José State University and the University’s Academic Integrity Policy requires you to be honest in all your academic course work. Faculty are required to report all infractions to the Office of Judicial Affairs. The policy on academic integrity can be found at http://www2.sjsu.edu/senate/S04-12.pdf

For your reference, the policy defines academic dishonesty as follows (please note the very low tolerance definition of plagiarism):

1.1 CHEATING

San José State University defines cheating as the act of obtaining or attempting to obtain credit for academic work through the use of any dishonest, deceptive, or fraudulent means. Cheating includes:

1.1.1. Copying, in part or in whole, from another’s test or other evaluation instrument including homework assignments, worksheets, lab reports, essays, summaries, quizzes,
etc.;

1.1.2. Submitting work previously graded in another course without prior approval by the course instructor or by departmental policy;

1.1.3. Submitting work simultaneously presented in two courses without prior approval by both course instructors or by the department policies of both departments;

1.1.4. Using or consulting sources, tools or materials prohibited by the instructor prior to, or during an examination;

1.1.5. Altering or interfering with the grading process;

1.1.6. Sitting for an examination by a surrogate, or as a surrogate;

1.1.7. Any other act committed by a student in the course of their academic work that defrauds or misrepresents, including aiding others in any of the actions defined above.

1.2 PLAGIARISM

San José State University defines plagiarism as the act of representing the work of another as one's own without giving appropriate credit, regardless of how that work was obtained, and submitting it to fulfill academic requirements.

Plagiarism includes:

1.2.1 Knowingly or unknowingly incorporating the ideas, words, sentences, paragraphs, or parts of, or the specific substance of another's work, without giving appropriate credit, and representing the product as one's own work;

1.2.2 Representing another’s artistic/scholarly works such as musical compositions, computer programs, photographs, paintings, drawing, sculptures, or similar works as one's own.

b. Campus policy in compliance with the Americans with Disabilities Act:

Students with disabilities who would need some kind of accommodation should make that known to the instructor:

“If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities register with DRC to establish a record of their disability.”
c. Right to Privacy:

You will retain a right to privacy. I will not knowingly reveal your grades, student ID number, phone number, address or other private information to others, except within the limits of university policy. I will ask that you supply your first name, last name and last four digits of your SID on written homework or tests. The grader system requires that you supply the first five digits of your SID as a password. Grader permits you to access your own grade records and your standing in the class online, but no other person’s grade records or personal data.

Hand In:

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All homework assignments and projects need to be typed and handed in as hardcopies and electronically. You also need to demonstrate Projects to the instructor. Handwritten extra assignments and projects are not acceptable and we receive a “zero” mark. Check submission guidelines. An “F” grade will be assigned if an individual doesn’t or refuse to work on team projects.

Class Webpage: http://www.engr.sjsu.edu/fayad/current.courses/cmpe226-spring2015 contains the syllabus, some of the homework and lecture notes, and occasional notices.