ISyE 4106B Senior Design Syllabus
Fall 2005

Instructors:

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Class Meetings:

Scheduled weekly meeting time for this class is **TuTh 12:00-3:00**. All class presentations will be held during this time in room **IC 205**. You should schedule convenient meeting times with your client and your advisor for client presentations, and for project discussions.

Course Objectives:

Senior design is intended to provide a problem analysis and system design experience similar to ISyE professional practice, and an opportunity to practice and perfect the skills of technical writing and oral presentation. By the time you complete this course, you should have improved your skills significantly in:

1. *Systems Analysis and Design*

    This includes the ability to:
    a. Define a problem
    b. Identify and analyze relevant factors
    c. Develop a model of the system under study
    d. Choose and apply appropriate IE methodologies and computational tools
    e. Generate and evaluate alternative solutions
    f. Design the needed system

2. *Technical Writing*

    You have chosen a field that demands effective written communication. Your skill in documenting the results of your work will determine to a large extent the value of that work. In addition to developing good writing skills, you should explore the possibilities offered by computing and networked information systems (subject to any constraints imposed by your client company).

3. *Public Speaking*

    It is not enough to do good work, you must also convince others, who may be apathetic or even antagonistic, that the work is good. Your skill in clear, concise, and convincing presentation may make the difference between a successful project and fruitless effort.

4. *Team Work*

    Life in the real world entails working together with people from different backgrounds, interests, styles, and temperaments. You will learn to cooperate with a diverse group of

individuals and coordinate your activities with others in your group and with your client, even when there are conflicting priorities. Successful groups learn to work harmoniously, complete the work on time, and prepare effective and professional reports and presentations.

5. *Project and Time Management*

   Interacting with a diverse group of individuals, completing your tasks satisfactorily and on time even as problems develop, and preparing various reports and presentations will sharpen your project and time management skills.

This course provides an opportunity for you to learn about the business world. Keep your eyes and ears open to your company's culture. Find out how the company has distinguished itself from its competitors, how it projects itself externally and how it views itself internally. To be successful in this course, your recommendations must be consistent with the company's strategy and culture. More than that, to be successful in your career, you must be sensitive to your employer's, your competitors' and your customers' corporate strategy and culture.

Project Groups and Advisors:

By now, you should have already joined a group and decided on your group's project for Senior Design. Within the first week of classes, your group will be assigned to one of the two instructors to be your group's advisor. You are responsible for keeping your advisor informed of your intentions and progress. However, you may seek advice from both instructors for this class. Seek the consent of the course instructors before calling upon other faculty for advice and assistance.

By **12:00pm on Thursday, August 25**, each group should submit to both instructors the **Group Composition Report**. This should include the list of group members (including names, phone numbers, e-mail addresses, and, preferably, a picture). In addition, a one-page résumé for each member describing professional interests and experience (if any), together with a schedule of courses being taken this semester, should be included. Designate one person on the team to be the lead contact.

In joining a group, you are committing to carry your share of the responsibility, and in asking someone to join your group you are accepting responsibility for the quality of their work. Your advisor is not responsible for ensuring that all team members do their share of the load. However, your advisor will assess your performance in the group (possibly seeking feedback from the rest of the group members) and decide your grade.

Client Company:

Your first task in this course will be to develop a detailed project definition with your client company with help from your faculty advisor. This is a strategic decision. Remember, this course offers a valuable opportunity to distinguish yourselves. Do not throw it away by developing a project haphazardly.

The project will require considerable time and effort from employees of your client company. This represents an expense. Nevertheless, clients participate in these projects for three reasons:

1. They expect to receive valuable assistance,
2. To express good will toward Georgia Tech and its students, and
3. To promote your education so that industry may benefit from more capable young engineers.

ISyE project teams must behave professionally and reinforce this feeling of good will.

Students are not allowed to receive compensation for work done in Senior Design. Companies may provide assistance in the form of photocopying and typing services, and in some cases, supplies and travel expenses.

Project Phases:

Your senior design project should be executed in the following three phases:

1. *Project definition phase*:

   This phase constitutes defining the design problem, understanding its significance and relevant factors, and proposing a design strategy. This phase should be concluded no later than **9/22/2005**.

2. *Interim phase*:

   This phase involves collecting, analyzing, and validating data, improving understanding of the relevant factors, and finalizing the design strategy. This phase should be concluded no later than **11/3/2005**.

3. *Final phase*:

   This phase involves implementation of the proposed design strategy and demonstrating the resulting value addition. This phase should be concluded no later than **12/8/2005**.

Deliverables:

Each of the three phases outlined above has the following associated deliverables. Your grade will be determined by the quality of these deliverables.

1. *Content*:

   This refers to actual work done towards the solution to the design problem at hand. 50% of your grade depends on the quality of the work content. Your grade depends on the ingenuity with which you use IE methodologies, the professional level of your work, and the value added resulting from your solution. We expect you spend at least 9 hours on this project each week for the entire semester. That comes to approximately 700 hours for each group. If you view your time spent as the equivalent of a consultant's time over the same period, worth about $2,000 per day, the value comes to about $175,000. In most cases, it is not unreasonable to expect this much value addition to the client as a result of your project. Keep this amount in mind while defining and working on your project.

2. *Report*:

   Each phase of the project requires you to submit a formal written report. Reports should be submitted on paper. In addition, electronic versions must be submitted in MS Word, a PDF file, or as self-contained html archives. The reports should be submitted to the faculty advisor and Dr. Norback. Three reports will be due during the semester.

a) Project Definition Report – this report should be regarded as a "contract," and you will be expected to perform as promised, both by your client and by your faculty advisor.
b) Interim Report – this report will describe the data collected, preliminary analysis and conclusions, and plans for the remainder of the semester.
c) Final Report – must be a comprehensive and self-contained report. A reader must be able to get a complete picture of the problem and what you have done to solve the problem.

25% percent of your grade depends on the quality of your reports. The reports should be professional and concise, and should be prepared with great care. Follow the provided guidelines in preparing your reports. Submit each report according to the course schedule. The instructors will provide some feedback, which you should incorporate in a revision of your report, which is due to the client at the time of the client presentation. It is important to do a good job on both reports; a good start on the first one will make a better, final product.

3. *Presentation*:

Each report has two associated presentations. 25% of your grade depends on the quality of your presentations. A presentation will first be made to the class. It is expected that all class members will be in attendance to hear all groups present. Each group will then make a presentation to their client and faculty advisor. The instructors will provide feedback on your class presentation, which should be used to improve the client presentation. *It is required that each group member presents a significant portion of at least one class presentation and one client presentation.*

It is very important that your presentations are of professional quality. You should spend time and effort in creating them and practicing them. The team member(s) presenting should be prepared to defend the team's assumptions, methods, and solution, and to answer questions. A clear and concise presentation of the solution and insight into the problem are of prime importance, and strict time limits will be imposed. Your attire for the client presentations should be in accordance with that of your client contacts. However, nothing short of business-casual is appropriate.

Submit electronic copies of your class and client presentations to your project advisor and Dr. Norback at jnorback@isye.gatech.edu; also provide electronic copies of your client presentations to the client. Also provide paper copies of your slides (in notes form) to the instructors and client attendees at the onset of your presentations.

Getting Assistance with your Presentations:

The ISyE Workforce Communication (WC) Lab is a new place where Senior Design students can get feedback on their presenting skills. The feedback is based on interviews with practicing industrial engineers, supervisors, and CEOs.

The purpose of the Lab is to enhance student communication skills so undergraduates
1) improve their performance in Senior Design, and
2) are better prepared to get a job and move up the career ladder.
In the Lab students can get comments on their slides and they can practice their presentations.

The Lab is located in Room 115 on the first floor of the Main ISyE Building (the old Management Building). The hours will be announced during the second week of classes. The

Director of the WC Program and Lab is Dr. Judith Norback: phone (404) 385-1079; email jnorback@isye.gatech.edu; Room 314 in Groseclose building.

Professional Conduct:

You should function as if you were an employee reporting to your faculty and to your client contact. Among others, you should:

- Keep you client's best interests as your paramount concern.
- Apply the proper tools and methodologies thoroughly, accurately, honestly and in a manner appropriate for the task at hand.
- Dress neatly and appropriately for the occasion.
- Always be prompt and punctual.
- Write clearly and type all reports.
- Include a title page, table of contents and page numbers in long reports.
- Use drawings that are neat, clean, properly titled, and scaled.
- Keep a copy of everything you give your instructors or client.
- Keep well-organized records of all your work.
- Date all your reports and correspondence.
- Use correct names (and titles where appropriate).
- Appropriately acknowledge everyone who assisted you in your efforts.
- Be honest in your dealings with colleagues, client, and faculty.

Tentative Schedule:

Date	Activity	Remark
8/25/2005	Group composition report	Submit to the instructors by 12:00pm
8/25/2005	Tutorial on Presenting and Audience Analysis	Room: IC 205
9/8/2005	Project definition report due	Submit to the instructors by 12:00pm
9/13/2005 to 9/15/2005	Presentation of project definition (in class)	Room: IC 205
9/20/2005 to 9/22/2005	Presentation of project definition to client	Schedule at least one week ahead
9/27/2005 to 9/29/2005	Industry Executive Panel; Tutorial on writing	Room: IC 205
10/18/2005	Interim report due	Submit to the instructors by 12:00pm
10/20/2005 to 10/25/2005	Interim presentation (in class)	Room: IC 205
10/27/2005 to 11/3/2005	Interim presentation to client	Schedule at least one week ahead
11/22/2005	Final report due	Submit to the instructors by 12:00pm
11/29/2005 and 12/1/2005	Final presentation (in class)	Room: IC 205
12/6/2005 to 12/8/2005	Final presentation to client	Schedule at least one week ahead

Reports are due to the client at the time of the client presentation.

The client presentations must be scheduled at times that are suitable to all attending parties (all group members, faculty advisor, and all client-side attendees). You are encouraged to hold one or more of your client presentations on campus, provided the client is agreeable to such an arrangement. They should be scheduled with sufficient notice for all parties.

As shown above, we plan to have a tutorial on presentation and audience analysis. We shall also have a writing tutorial before the interim report is due. Finally, we plan to have a class meeting

(possibly in the last week of September) where a panel of Executives from industry will relate their real-world experiences regarding workforce communication in IE design.

Attendance:

Attendance is mandatory for all class presentations (including presentations of groups other than your own), your group's client presentations, meetings with your group's advisor and client, the tutorials, and the class meeting with industry executive panel.

Group Member Evaluation:

Each group member will be required to evaluate the contributions of the other members of his/her group at the conclusion of the interim phase and at the conclusion of the final phase. The instructors will provide evaluation forms for this purpose. Completed evaluation forms must be handed in to your advisor no later than the time of the group's interim and final presentations to the client.

Grading:

Your group's grade will be based on the quality of the work content, report, and presentation in the three phases of the design project. Feedback from the client on the quality of your work will be factored into the grade.

Your individual grade will be based upon your group's performance, but also on own contribution and performance within the overall group activity. Feedback from your client and the opinion of the instructors about your contributions may also factor in your individual grade. Attendance in all class meetings, client presentations, and meetings with your client and advisor will also affect your individual and group grades.

The Challenge of Design:

The Senior Design course is considered to be one of the most valuable courses in the curriculum. It is also one of the most difficult. Your problems will not be clearly defined, relevant data will be unavailable or hard to obtain, the proper analysis techniques may not be apparent, solutions will not be exact, and you will disagree about the right course of action. After working for some time on a project, you may discover you are on the wrong track and that the real problem lies elsewhere.

This is your challenge. You will face situations unlike those presented in textbook examples. You will need to recall material from the many courses you have taken at Tech and your faculty advisor will expect you to demonstrate competence in all of them. On top of this, you will have to learn new material not covered in your courses, outside your advisor's areas of expertise.

Above all, you will be evaluated on how effectively you work, not how hard you work. Your contributions will be measured in terms of the value it adds to the project, not in terms of the hours you spend on it. So, you must not only work hard, you must also work smart.

Legal Disclaimer:

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