MS&E 108 SENIOR PROJECT 2016-2017

Five Fridays in Room 200-205

January 13, 20, and February 3, 9:30-10:30 am; March 10 and 17, 8:45-11:20 am

MS&E 108 on canvas.stanford.edu

MS&E 108 COURSE DESCRIPTION

The course faculty this year includes Professors Warren Hausman, Ramesh Johari, Riitta Katila, Elisabeth Paté-Cornell, Markus Pelger and Ross Shachter **(course coordinator)**. The course assistant is Onder Guven.

This course is devoted completely to your senior project. You form four-person teams, preferably in December 2016, but no later than January 16, 2017. Each team is responsible for identifying an organization with a project that can be addressed using methodology learned in your MS&E courses. MS&E faculty have contacts at a number of local organizations with potential projects. Contact Prof. Shachter (shachter@stanford.edu) as soon as possible for details if you anticipate needing assistance identifying a project. (You must form and register a four-person team before requesting project leads.)

The learning outcomes of this course are to help you further develop the following skills:

- Formulation: identifying, formulating, and solving engineering problems;
- Analysis: using the techniques, skills, and tools necessary for engineering practice;
- Communication: communicating effectively; and
- Teamwork: functioning effectively on multi-disciplinary teams.

Your team will be assigned a faculty advisor who will serve as a combination consultant and supervisor throughout the quarter, and who must approve your project. Both a written and an oral report are required. You should work with the Communications Program in the School of Engineering for help with your oral report. Finally, just as in the "real world," deadlines are crucial, and missing them bears consequences.

Your faculty advisor will assign grades to your team based primarily on your final oral and written reports. Advisors will also take into account your contribution to the team's efforts, and your attendance at class and project team meetings.

STANDARDS FOR PROFESSIONAL BEHAVIOR

The course prepares students for careers as professionals applying the concepts of management science. Students should think of 108 as training for the real world where tardiness and absences reflect on your qualifications. We expect professional behavior from students, including being proactive and assuming responsibility rather than making excuses for progress not made. Being punctual for your meetings with your faculty advisor and industry clients, attending all class and group sessions, and delivering high quality oral presentation and written materials on time are part of these norms. Your grade will reflect your ability to meet

TEAM FORMATION

Students are responsible for forming four-student teams and registering their teams on the course web site. Students looking for teammates can advertise on the course web site. Those students still not on teams by the first class session will form teams in the classroom that day.

PROJECT DEVELOPMENT

The course faculty will use their contacts to develop projects in both the public and private sectors that will be advertised on the course web site. Registered teams can sign up to investigate one of those projects exclusively for up to three business days. Students are also encouraged to use their own possible contacts to develop projects under the following guidelines, and they can consult with the course faculty for assistance.

1. Look for high level of interest and commitment from the potential client and willingness to work with your team.
2. Look for clear project statements with reasonable scope.
3. Look for projects where the client has a real opportunity they want to develop and avoid hypothetical "benchmarking" projects.
4. Avoid clients in which any team members hold a substantial financial interest.
5. Avoid startups and any clients where you get:

   a. Slow return of phone calls or emails;
   b. Unclear, inconsistent project statements;
   c. Vague response regarding requests for data;
   d. Slow or late setting of meetings; or
   e. Project scopes which are too large or too vague.

PROJECT DESCRIPTION

The project description is due from all teams by 5 pm on Tuesday January 24, 2017, submitted via the course web site, regardless whether you have finalized your project. It allows us to assign faculty advisors to teams by describing your team's problem, what you plan to do, and how you plan to do it. It contains the following sections:

1 Project title;
2 Administrative information (contact information for the client and team members) and complete disclosure of all relationships between team members and the client;
3 Brief statement or description of the problem, approaches you plan to use, and nature of the results you plan to deliver; and
4 A schedule of 5-6 available meeting times (one hour blocks between 8am-6pm, Monday-Friday) when your **entire team** can meet with your faculty advisor. (Note that your team is assumed to be available during class time, Fridays at 9:30am, and some faculty might also be able to schedule evening meetings, if you want to include some additional meeting times.)

PROJECT TEAM MEETINGS

All teams will be responsible for scheduling weekly meetings with their faculty advisor at a mutually convenient time. All team members are expected to attend each meeting. In preparation for each meeting, your team should email your advisor a one or two page summary at least 24 hours prior to the meeting, copying everyone on the team. The summary should contain these items:

1 A review of work accomplished since the last meeting,
2 A description of what work will be done next, and
3 A list of questions and issues to be discussed at the meeting.

To facilitate preparation for your team's meeting with your faculty advisor, you should schedule a **second, working meeting** with your team once each week, several days prior to the meeting with your faculty advisor.

WRITTEN REPORT

You submit your final written report to your faculty advisor (in hardcopy), the client organization, and the course archives. Your written report should contain these items:

- Letter of transmittal to the client organization (attached to the report)
- Cover page • one-page Executive Summary • one-page table of contents
- • Report sections as follows (modified to suit your particular project):
  - Introduction (including organization background, nature of the problem, and project description)
  - Methods (including any model and data collection)
  - Results
  - Conclusions and recommendations, possibly including the societal implications of those recommendations
  - Technical appendices

Please use at least 1.5 line spacing and reasonable font size for readability; number body pages 1, 2 … and Appendix pages A-1, B-1, B-2, C-1, … and use those numbers when referring to material in an Appendix.

There is no minimum or maximum number of pages in the body of the report or in the appendices. Typical reports will have a body length of between 10 and 20 pages and between 5 and 15 pages of Appendix material.

Discuss the content with your faculty advisor. Ideally, you should prepare sections of the report (e.g., project description, methods, etc.) as you progress along the project timeline. Your grade will likely suffer if you leave all the writing to the end.

The written report will comprise the majority of your course grade, as modified by your attendance and your contribution to the project's success. In grading reports, faculty advisors evaluate both technical content and presentation style (including such things as appropriate organization, use of headings, clear explanations and charts, and absence of grammatical errors or misspellings). The report should clearly reflect your effort during the quarter and the quality of your solution; in other words, it should represent your achievement. You may ask your advisor to discuss with you specifics of what he or she expects in the context of your particular project.

You should submit the final written report to your faculty advisor, your client organization, and the course archives by the last day of class (March 17, 2017).

ORAL PRESENTATION

During the last two weeks of the quarter, each team will make a 12-minute oral presentation to the class. All team members should participate equally, both in time and effort. Please bring your presentation to class on your computer with any necessary video adapter, along with a copy on a flash drive as a backup, and submit it afterwards to the course archives. Dress code is business professional, such as suits, and all students are invited and expected to attend a Faculty Club lunch with their advisors afterward.

Please inform the people you have worked with at the client organization that they are welcome to attend our final oral presentations and the Faculty Club lunch afterward. They truly enjoy being invited, being introduced to the class, and listening to the results of projects. You should also offer to present your findings to the organization.

All teams are expected to schedule and attend at least one tutorial with the staff of the School of Engineering's Oral Communication Program in the Terrace level of the Huang Engineering Center, at least a week before your presentation in class. Do not wait until the last minute to schedule your tutorials.

Every year Accenture sponsors monetary awards to be split between the top two senior project oral presentations in MS&E 108. The course faculty determines the winning teams based on the oral presentations, and the awards will be announced and presented at commencement. Criteria for judging the presentations include ample motivation for the problem, sufficient support for the methodology, clear explanation of the results, and quality of presentation skills.

SCHEDULE OF CLASS SESSIONS AND DELIVERABLES

The class meets only five times during the quarter, on Friday mornings. The first three meetings will be held at 9:30 a.m. for about an hour. The other two meetings, at the end of the quarter, will be more than two hours, but the times and location might change to accommodate all team presentations.
All students should be present and on time at each class session.

You are expected to attend all the weekly meetings with your faculty advisor, and to submit all materials by their due dates as noted below.

Fri, Jan 13 Brief Meeting, 9:30-10:30 am: Announcements and Team Identification
Finalize teams and, if possible, projects.

Fri, Jan 20 Brief Meeting, 9:30-10:30 am: Team Formation and Project Matching
Required of any students still forming teams or teams still looking for projects.

Tues, Jan 24 By 5 pm you must submit your Project Description via the course website.

Thurs, Jan 26 Assignment of Faculty Advisors

Fri, Feb. 3 9:30-10:30 am, Presentation by School of Engineering Technical Communications Program

Fri, Feb 10 Submission of Written Report Introduction to Advisor: Email a draft of your report introduction to your faculty advisor by 5 p.m. Include material from your Project Description, expanded as appropriate.

Fri, Feb 24 Submission of Written Report Outline to Advisor: Email the outline of your report to your advisor by 5 p.m.

Fri, Mar 3 Submission of draft Written Report to Advisor: Hand in a complete draft of your report to your advisor by 5 p.m.

Fri, Mar 10 8:45-11:20am, Oral Presentations (in class)

Fri, Mar 17 8:45-11:20am, Oral Presentations (in class)

Fri, Mar 17 Submission of Written Report to Advisor and Client Organization: Hand in your complete Written Report to your advisor by 5 p.m. Also submit a copy of your report and slides to the course archives.