MS&E 108 SENIOR PROJECT 2017-2018

Five Fridays in Room 200-203

January 12, 19, and February 2, 9:30-10:30am; March 9 and 16, 8:45-11:20am

MS&E 108 on canvas.stanford.edu

MS&E 108 COURSE DESCRIPTION

The course faculty this year includes Professors Samuel Chiu, Riitta Katila (course coordinator), Elisabeth Paté-Cornell, and Markus Pelger. The course assistant is Kelley Luyken (kluyken@stanford.edu); her office hours are by appointment.

This course is devoted completely to your senior project. You will form four-person teams, preferably in December 2017, but no later than January 16, 2018. Team registration is on Canvas. Each team will be responsible for identifying an organization with a project that can be addressed using methods learned in your MS&E courses. MS&E faculty have contacts at many local organizations with potential projects. Contact Kelley Luyken 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 your insights effectively orally and in writing; and
- Teamwork: functioning effectively on multi-disciplinary teams.

Your team will be assigned a faculty advisor who must approve your project, and will serve as a consultant and supervisor throughout the quarter. Both written and oral reports are required. You are strongly recommended to work with the Technical Communication Program in the School of Engineering for help with both reports. Finally, just as in the "real world," deadlines are crucial, and missing them will bear consequences.

Your faculty advisor will assign grades to your team based primarily on your final oral and written reports. Advisors will also consider your individual contribution to the team’s efforts, as well as 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 poorly 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 presentations and written materials on time are part of these norms. Your grade will reflect your ability to meet these norms.
TEAM FORMATION

Students are responsible for forming and registering four-student teams. Team registration can be found on Canvas: Go to the “People” tab, select the “Project Teams” tab, and assign yourselves to one of the teams. Students looking for teammates can post in the “Finding Teams” discussion thread on Canvas. Those students still not on teams by the first class session will form teams in class that day.

PROJECT DEVELOPMENT

The course faculty will use their contacts to develop projects in public and private sectors that will be advertised in the “Pages” tab on Canvas. Registered teams can sign up to investigate one of those projects exclusively for up to three business days. To do so, contact Kelley Luyken (kluyken@stanford.edu). Students are also encouraged to use their own contacts to develop projects based on following guidelines. You may consult with the course faculty for assistance. When developing projects, students should:

- Look for clients with high levels of interest, commitment, and willingness to work with your team.
- Look for clear project statements with reasonable scope.
- Avoid hypothetical “benchmarking” projects, and instead look for projects where clients have real opportunities that they want to develop.
- Avoid clients in which any team members hold a substantial financial interest.
- Avoid startups and other clients where you get
  - Slow return of phone calls or emails;
  - Unclear, inconsistent project statements;
  - Vague responses regarding requests for data;
  - Slow or late scheduling of meetings; or
  - Project scopes that are too large or too vague.

PROJECT DESCRIPTION

Project descriptions are due from all teams by 5pm on Tuesday January 23, 2018, submitted via Canvas, regardless of whether you have finalized your project. This allows us to assign faculty advisors to teams. Please include the following:

- Project title;
- Administrative information (contact information for the client and team members) and full disclosure of all relationships between team members and the client;
- Brief statement or description of the problem, methods you intend to use, and the nature of the results you plan to deliver;
- A schedule of 5-6 possible meetings times (one hour blocks between 8am and 6pm, Monday-Friday) when your entire team can meet with your faculty advisor. Note that you are assumed to be available during class time on Fridays.
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. At least 24 hours prior to each meeting, your team should email your advisor a one- to two-page summary containing the following:

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

To prepare for meetings with your faculty advisor, you should schedule a second, working meeting with your team once every week, several days prior to the meeting with your faculty advisor.

WRITTEN REPORT

As a professional management science, you will need to communicate results and insights from your analysis effectively. The insights from your senior project work are useless unless you can engage decision makers orally and in writing. All members of your team must contribute to reports, and learn to do so effectively as a team. The written report is submitted in stages, allowing you to improve it iteratively and incorporate feedback from your faculty advisor.

At the end of the quarter, you will submit your final written report to your faculty advisor, the client organization, and the course archives. All team members should contribute equally, both in time and effort. Your written report should contain these items:

- Letter of transmittal to the client organization (attached to the report)
- Cover page, including the project title and team members’ names
- One-page executive summary
- One-page table of contents
- Report sections as follows (may be modified to suit your project):
  - Introduction, including client background, problem statement, and project description
  - Methods, including any model and data collection
  - Conclusion and recommendations, possibly including societal implications
  - 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. Typical reports will contain about 10-20 pages of body material, and 5-15 pages of appendix material.
The written report will determine most 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 elements as appropriate organization, clear explanations of concepts, accurate and clear figures and graphics, use of reader-friendly devices and formatting (e.g. descriptive headings), and professional style (e.g. appropriate tone, 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 should discuss with your advisor specific expectations in the context of your particular project.

To help polish reports, all teams are expected to **schedule and attend at least one tutorial** with the writing tutors from the Technical Communication Program. Details about how to sign up will be sent out in February.

You should submit the final written report to your faculty advisor (via Canvas) and your client organization by the last day of class (March 16, 2018).

**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 to the course archives afterward. Dress code is business professional (i.e. 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. 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.

Teams are encouraged to schedule and attend a tutorial with the oral communication tutors from the Technical Communication Program. Details about how to sign up will be sent out in February.

Every year we recognize the top senior project in MS&E 108. The course faculty selects the winning team based on the oral presentations, and the winning team will be announced at commencement. Criteria for judging the presentations include ample motivation for the problem, strong 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 must 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 12**  Brief Meeting, 9:30-10:30 am: Announcements and Team Formation
Finalize teams and, if possible, projects.

**Fri, Jan 19**  Brief Meeting, 9:30-10:30 am: Project Matching
Required of any students still looking for projects.

**Tues, Jan 23**  Submit your project description by 5pm (via Canvas).

**Thurs, Jan 25**  Assignment of Faculty Advisors

**Fri, Feb. 2**  Brief Meeting, 9:30-10:30 am: Technical Communication Program

**Fri, Feb 9**  Submit your draft introduction by 5pm (via Canvas). Include material from your Project Description, expanded as appropriate.

**Fri, Feb 23**  Submit an outline of your written report by 5pm (via Canvas).

**Fri, Mar 2**  Submit a draft of your written report by 5pm (via Canvas).

**Fri, Mar 9**  Extended Meeting, 8:45-11:20am: Oral Presentations (in class)

**Fri, Mar 16**  Extended Meeting, 8:45-11:20am: Oral Presentations (in class)

**Fri, Mar 16**  Submit your final written report by 5pm (via Canvas). You are also required to submit your report to your client organization; please cc your advisor on that email.