To: ME 195A Engineers  
From: BJ Furman, Project Director  
Re: Guidelines for Fall Semester  

August 25, 1999

This memo is intended to give an overview of what will be expected from your team this semester. The information below explains in more detail what the deliverables entail:

- **Team Formation and Vital Information Summary Sheet**  
  Due Date: September 1, 1999  
  The team should identify a team leader for the semester and completely fill out the Vital Information summary sheet (you can download the file, ME195vital_info.zip at: [http://www.engr.sjsu.edu/bjfurman/courses/ME195/](http://www.engr.sjsu.edu/bjfurman/courses/ME195/)).  
  The team leader will be the primary contact between the team and the faculty advisor and will have responsibility for seeing that the team follows through on its deliverables.

- **Background of the problem, goal statement, and state-of-the-art review**  
  Due Date: September 15, 1999  
  The background should identify the nature of the problem and clearly explain the need for the solution you will design. You will need to investigate what prior work has been done on the problem or related problems by reviewing pertinent literature, interviewing the project sponsor, consulting potential users, etc. The key idea in this stage is to *clearly understand the problem* and what prior work has been done to solve it. This will help you avoid “reinventing the wheel” in your design work. Capitalize on components that are available “off-the-shelf”, and concepts that have already been developed.  
  The goal statement should be a succinct, general statement described in terms that functionally visualize what the solution must do.  
  The state-of-the-art review is a summary of existing or proposed designs, patents, literature, etc. that are pertinent to the problem at hand. The goal here is to clearly understand what the current practice is relating to the solution of your problem or a related problem.

- **Functional specification**  
  Due Date: September 22, 1999  
  The functional specification (FS) is basically a vital document that guides the design effort. The FS clearly spells out in specific, *quantifiable* terms how the solution must perform.  
  The FS must identify (with some ordering of priority):  
  - the essential functional requirements  
  - the desirable (but not essential) functional requirements  
  - the important constraints that must be satisfied  
  The FS must be written tightly enough so that a design which meets the FS, fully achieves the project goal, yet written loosely enough that it encourages the widest possible range of solutions.

- **Brainstorming and concept generation**  
  Due Date: September 29, 1999  
  The goal here is to generate a large number of possible approaches to achieving the design goal. Each team member will submit at least 5 concepts documented by rough sketches with notes explaining how the design is to work and how the parts are to be arranged. Visit [http://www.ecsel.psu.edu/setce/EDG100/Database/Brains.html](http://www.ecsel.psu.edu/setce/EDG100/Database/Brains.html) to find out how to brainstorm effectively.
• **Critiques and rough analyses of concepts**
  Each team member will select at least two different design concepts and broadly analyze and discuss some important quantifiable parameters or factors which pose the major limits to size, reliability, function, cost, speed of operation, or other significant feature. Use order of magnitude estimates and simplifying assumptions to develop guiding principles in your design.

• **Selection of design alternatives**
  Identify and document the most promising design alternative using results from your analyses, decision matrix, etc. Include a description of how you arrived at your prime selection.

• **Presentation #1**
  You will give a 20-minute presentation following the guidelines given in your course manual. Your presentation should cover:
  - Project introduction, background, and goals
  - State-of-the-art review
  - Functional specification
  - Concepts and concept selection
  - Future work to be done
  Each member of the team should participate in the presentation.

• **Design mockup/simulation**
  Identify some important idea in your design and create a mock-up or simulation of it. Wood, foam core, plastic, etc. are good materials for a quick prototype. Use this deliverable as an opportunity to investigate aspects of your design that may be difficult to foresee without building a physical or virtual model.

• **Presentation #2**
  You will give a 15-minute presentation following the guidelines given in your course manual. Your presentation should cover:
  - Project introduction (brief highlight)
  - Functional specification
  - Prime design concept
  - Design mockup and progress to date
  - Any anticipated problems
  - Future work to be done

• **End of semester report**
  The final report must integrate the deliverables into a coherent whole. Use the guidelines on how to write a project report (See [http://www.engr.sjsu.edu/bjfurman/courses/ME195/proj_rep_guide.html](http://www.engr.sjsu.edu/bjfurman/courses/ME195/proj_rep_guide.html)). You should include layout and detail drawings of your design concept and parts, to scale.

**Additional Notes**

One of the keys to successfully completing your project is to immerse yourself into the problem and related subjects immediately and continuously. The more you learn about pertinent topics, the more fully you will be equipped to solve your design challenge.

Fostering and maintaining good teamwork is critical to the success of your project (and semester grade). You are a team, so carry on all your activities with that in mind. Fragmentation of your team will profoundly limit your success and will lead to frustration. I strongly suggest that you appoint a team leader, someone who will take responsibility for watching over the team, and the person I can look to as the primary interface to the team. Plan for your team to have regular
meetings. Communication among team members is of the utmost importance.

I will expect an agenda from the team before any meeting I have with the team. No agenda, no meeting. The agenda should be a few bullets that outline what will be discussed during the meeting. I will also look to one of the team members to take notes during the meeting. The notes should outline the key points discussed, the actions that will be taken with dates, and who is responsible for which action. Please give me a copy of the minutes after the meeting.

If appropriate, make sure you use a pointer in your presentations. I will subtract from your evaluation if you do not use a pointer where it is appropriate to do so.

Acknowledgments

What does it mean to be a “team”?
A team is a group of people that work together to achieve a common goal. In conjunction with planning, communication, and cooperation, members of a team work on predefined tasks. The completed results of these tasks, taken together, constitute the completed project or common goal. The personal satisfaction that comes from accomplishing the goal can be tremendous when the team functions well. On the other hand, when the team functions poorly, it is easy to get frustrated and disillusioned.

How can you ensure success of your team?
1. Communicate regularly and completely
2. Plan well
3. Take responsibility and deliver on what you’ve committed to do
4. Have a positive attitude
5. Cooperate and help each other
## Resources for ME 195:

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<td><strong>ME 195 web site</strong> (<a href="http://www.engr.sjsu.edu/bjfurman/courses/ME195/">http://www.engr.sjsu.edu/bjfurman/courses/ME195/</a>)</td>
<td>Course web site with all course materials and many useful links.</td>
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<tr>
<td><strong>Overview of the design process</strong> (<a href="http://www.ecsel.psu.edu/setce/EDG100/Database/Design_Front.html">http://www.ecsel.psu.edu/setce/EDG100/Database/Design_Front.html</a>)</td>
<td>A nice, brief overview of the design process from the NSF-sponsored ECSEL Coalition.</td>
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<td><strong>Electronic library resources</strong> (<a href="http://www.library.sjsu.edu/">http://www.library.sjsu.edu/</a>)</td>
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<td><strong>Patent search and other patent resources</strong> (<a href="http://repo-nt.tcc.virginia.edu/InventionAndDesign/resources/RepoHome.htm#patent">http://repo-nt.tcc.virginia.edu/InventionAndDesign/resources/RepoHome.htm#patent</a>)</td>
<td>Links to helpful web resources to search for patents. See also the <a href="http://www.patents.ibm.com/">IBM Intellectual Property Network</a>.</td>
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<td><strong>Mechatronic component resources</strong> (<a href="http://www.engr.sjsu.edu/bjfurman/courses/ME106/componentinfo.htm">http://www.engr.sjsu.edu/bjfurman/courses/ME106/componentinfo.htm</a>)</td>
<td>Links to components, manufacturers, and suppliers of new and used parts for mechatronic devices.</td>
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<td><strong>Other links to resources related to mechatronics</strong> (<a href="http://www.engr.sjsu.edu/bjfurman/courses/ME106/othermechatronicslinks.htm">http://www.engr.sjsu.edu/bjfurman/courses/ME106/othermechatronicslinks.htm</a>)</td>
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