

Team Assignment #1
The Design Process

Reading Assignment:

Read Chapter 4 in Engineering Fundamentals – An Introduction to Engineering, 2nd Edition by Moaveni.

Lecture #13 – The Design Process

Team Assignment:

The instructor will divide the teams class into teams of 3-5 students per team. Share names, phone numbers, email addresses with your team members to that you can contact each other if necessary. Each team member should be reminded of the need to be present for each class for the rest of the semester as attendance will be taken and attendance will have a direct impact on grade. Your team members are also counting on you to do your share of the work. As a working engineer, you will certainly be held accountable for your part in each project.

Read the rules for the ASEE 2009 Model Design Competition. As a team complete each of the following exercises. Organize your results into a report and submit a single typed report for the group to the instructor by the assigned due date. The report should consist of:

- 1) A **title page** as shown below.
- 2) Neatly presented lists corresponding to the 7 categories listed on the following page (and shown in the lecture notes).

EGR 120 Introduction to Engineering <u>Team Assignment #1</u> Due Date		
Group #N (your group number)		
<u>Attendance & Participation Record</u> (list all team members and all dates when teams worked together in class on this assignment and check boxes to mark attendance)		
Team Member	Date 1	Date 2
John Doe	✓	✓
etc		

As a team, discuss each of the following items and make lists (or sketches) as required. All information must be neatly presented in a team report (along with the title page described earlier).

- 1) **Step 2 –Problem Definition and Understanding**
Vehicle Specifications – List specifications for the vehicle.
- 2) **Step 2 –Problem Definition and Understanding**
Track Specifications – List specifications for the track.
- 3) **Step 2 –Problem Definition and Understanding**
Performance Specifications – List the tasks that the vehicle must be able to perform, actions that will disqualify a vehicle from completing a valid time trial, etc.
- 4) **Step 2 –Problem Definition and Understanding**
Subtasks - A good way to handle a large problem is to break it into tasks. For example, one team might work on a steering system for a vehicle. What subtasks might be used for this competition?
- 5) **Step 3 –Research** – The infrared sensors used for line following in many previous ASEE robotics competitions work well in distinguishing dark surfaces from light surfaces, but do not typically work well at distinguishing different colors. Do some research on methods that might be used to distinguish red golf balls from blue golf balls. Cite any online sources used.
- 6) **Step 4 – Conceptualization**
Navigation - Brainstorm to consider ways that a vehicle might navigate the track. Be creative! Consider using various types of sensors.
- 7) **Step 4 – Conceptualization**
Ball collection and delivery - Brainstorm to consider ways that a vehicle might collect the balls from the track and deliver them to the goals provided on the track.
- 8) **Step 4 – Conceptualization**
Ball collection and delivery – Create sketches for your best two ideas for collecting the balls and delivering the balls to the goals provided on the track. Include as much detail as possible and be sure to include labels identifying parts on the sketch.