TIM 172A: MOT I

Structured Problem Solving Process

Perhaps the most valuable lesson you can learn from this course is the discipline of organized problem solving. An effective problem solving process that you should adopt is described below. Each homework/exam problem should be structured, solved, and **presented** using the framework below. **Customize this process** in a way that makes sense for the particular problem or project you are working on. **Do not merely follow the steps below in an unthinkingly rigid or formulaic manner.**

1. **Define** the problem
   Clearly define the problem(s) you are attempting to solve. Identify the **real** problems that need to be solved.

2. **Plan** the treatment of the problem, i.e., the way in which you going to structure your analysis of the given information in order to solve the problem. Define the process (logical set of steps) for solving the problem by carefully addressing the following questions:

- What information is available for solving the problem?
- What assumptions need to be made to make the solution process manageable?
- What is the issue tree, if any, for the problem?
- What analysis needs to be performed to resolve the issues defined in Step 1?

3. **Execute** the plan:

- Systematically take each one of the problems in Step 1 above and perform the relevant analysis from Step 2.
- Clearly state the results of your analysis.
- Draw meaningful conclusions from your results, and develop recommendations and/or guidelines based on your conclusions.
- Make extensive use of figures, tables, trees, etc. to shape your thinking and analysis. Figures, trees, etc. **can be hand-drawn**.
- Structure your presentation (**with titles, headings, sub-headings**) to clearly show the "logic" of your process. Assume that you are reviewing your own solution five years later: would you be able easily and effortlessly to understand your solution?

4. **Check** your work

- Is the work correct in every detail?
- Are my assumptions reasonable?
- In terms of the things I know, do the results make sense?

5. **Learn** and Generalize

- What have I found out? What does the result mean?
- How may the result be affected by my assumptions?
- Are the results good enough to act on, or must I refine the solution?