Department of Mathematics and Computer Science
South Dakota School of Mines and Technology

Project Requirements: Solve a problem of your own creation that illustrates a major solution method covered in this course. Problems must be pre-approved by the course instructor. It is expected that the problem will likely involve an ODE or PQE solution. However, it may include novel applications of other topics such as LP, Numerical Integration, etc., but the challenge is to make these problems involved enough to warrant full credit. Students often suggest problems that are so inclusive they would make good thesis projects. Such problems can usually be simplified to make them appropriate projects.

Written Report:
  Format (do not deviate from this)
    Title Page with
      A title specifically for and descriptive of your project
      Course number
      Names (first and last) of the group members
      Date
  Body of Report with the following headings
    Project Description *(a paragraph will do)*
      A brief prose description your grandparents would understand
    Mathematical Description *(equations with text)*
      A concise mathematical description your Calc I professor would approve of but that your MATH 373 associates can understand
    Solution Method *(a few sentences – perhaps more)*
      A prose (and perhaps mathematical, if you like) description of the solution method that your MATH 373 associates can understand. ***Include any simplifying assumptions made.***
    Results *(a nice, concise, result)*
      A graphical or other appropriate display of the solution that your MATH 373 associates can understand.
    Comments *(a few sentences, more ok)*
      Note using prose any interesting or noteworthy features of the solution. These might include things like:
        BC's satisfied – PDQ Heat Equation
        Unused resources – LP
        Decisions now possible – many
        Comparison to circuit theory – ODE (EE's)
        Heating demand was --
        Thermal arrest in cooling curves –
        The 2D interpolation routine appeared - -
      Comment on what you wondered or worried about before you solved the problem. Assumptions?

Oral Report:

- The oral report is to be very organized, four-minute overview of you project.
- **It should consist of the same elements in about the same order as the written report.**
- Do not read from the slides.
- Face the audience – do not face the screen and talk. **[Most common Error]**
- Use Power Point or MathCad
- Arrive early and preload your presentation
- Do not close Power Point when you are done (that could close other's preloaded presentations)
- Plan on
  - 20 second Introduction
    - Current team introduces next team
    - Last team intros first team
    - Write your title and names on a card for the team introducing you
    - Get introduction card before class starts
      (name & title)
    - 1 slide (Title/Names/Idea)
    - last team intros first team)
  - 30 seconds to present the topic - 1 slide (a picture or sketch is nice.
    - Lots of words bad.
    - Pasted copy from your report – very bad.
  - 60 seconds to present mathematical description - 1 or 2 slides
    - Big enough to read
    - Derivations are too time consuming and inappropriate here
  - 30 seconds to present assumptions, if any - (No slide good idea)
    - This may be done while previous slides are up or perhaps mentioned when the sketch, if you have one is up)
  - 40 seconds to present results and point out interesting things
    - Show a figure, if possible
    - If no figure, communicate the value of the result and consider bulleted items
  - 60 seconds to answer questions
    - Each person in the class should ask one question during the presentations
    - Lengthy discussions will be deferred to after class
  - 4 minutes Total

The next team should go to the computer and get ready to present as the current team is answering questions. The team getting ready to present will close off the previous presentation file. This will help prevent accidental closing of Power Point. Presentations can be in MathCad, also. It is probably best to not go back and forth to Power Point/MathCad. Pictures may be pasted into MathCad.