PETE 693—EXPERIMENTAL METHODS IN PETROLEUM ENGINEERING

Some more guidance regarding the project

First, full disclosure, I am doing research in some of the topics I will mention below. You will notice that they are mainly related to production engineering. If you have other ideas, please let me know and we can decide whether it meets class objectives. If I think it does not meet the class objectives, I will let you know.

For the project, you will be in groups with a minimum of **one** person and a maximum of **three** people. I would prefer if the members of any given group are from different backgrounds.

My thinking is that for most of you the project will evolve in the following manner:

1. Take one of the project topics/areas (experimental modeling of the CHOPS process). You will apply the techniques learnt in class to solve some problem associated with your project topic. This may not include data collection but must involve a deeper understanding and a more rigorous application of the concepts learnt in class.

   AND/OR

2. Take one of the project topics/areas. Collect data from technical literature regarding the project topic, analyze the data and use techniques learnt in class either to test an hypothesis or develop a model.

Suggested project topics

a. Design of a new apparatus for measuring fracture conductivity.
b. Development of a fracture conductivity model using data from technical literature.
c. Experimental modeling of the CHOPS process.
d. Design of an apparatus to investigate proppant transport in fractures.
e. Design of an experimental apparatus to investigate heat transfer to permafrost from a completion.
f. Design of an experimental apparatus to measure pressure drop in pipes for multi-phase flow.
g. Experiment to investigate the flow mechanisms in unconventional reservoirs.

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In order to ensure that you work on the project throughout the course of the semester, I have prepared the following schedule. The exact route you follow will depend on your project and with my agreement, you can modify the deliverables in this schedule. You cannot however modify the due dates.

I encourage you to use **Google docs** so that the members of each group can have access to the documents you are creating. All you need to do to submit the documents is to share the documents with me.

The deadlines are **FIRM**. I will be strict in the application of these deadlines. Late submission will have an impact on your grades.

Over the next I week, **October 1st to 8th**, I will be meeting with the students in Fairbanks. Please send me an email as to when you want meet with me during this period. I will meet with the students in Anchorage on **October 10th** after class.

Start date: 1st October 2013

Module 1(2 weeks)—15th October
Literature review—with the aim of understanding the problem area, relevant variable identification and some data collection. Write report including references.

Module 2(2 weeks)—29th October
Complete relevant variable identification; use of DA/IA to determine dimensionless groups and scaling criteria. Write report including references.

Module 3(2 weeks)—12th November
Determine the dependent and independent variables in your setup. Develop experimental setup (dimensions, materials to be used, ancillary equipment you think would be necessary for setup). Develop an experimental schedule if you had a lab. This is in order to develop a linear or a 2nd-order model for your problem.
Development of the model based on data. Test model adequacy, etc.
Write report including references.

Module 4 (2 weeks)—26th November
Refine your model and revise your approach based on the results from Modules 1 to 3. Write report including references.

Module 5 (2 weeks)—12th December
Compile all the reports and submit a final report and presentation including relevant tables, figures and references. Your final report should be in accordance with the SPE style guide (loaded to Blackboard) and should include at least an abstract, introduction, and DA/IA section, description of data /experimental setup /experimental schedule, model development, results, discussions and finally, conclusions.