Goals of PETE 620:
In simple terms, the goal of PETE 620 (Fluid Flow in Petroleum Reservoirs) is to take the student from "sand grains to the classic solutions used in reservoir engineering." The path begins with a review of mathematics because many of us need to re-familiarize ourselves with algebra, calculus, differential equations, numerical methods, special functions, and other related topics/subjects. This review is intended to address most of the skills/topics which will be required in the course.

We then proceed to study the (mostly) empirical aspects of geology and petrophysics (rock properties), and then on to the fundamental building blocks of reservoir engineering: permeability, capillary pressure, relative permeability, and the electrical properties of reservoir rocks. After this we work through the "flow relations" — steady-state Darcy and non-Darcy flow, Material Balance (needed for conservation of mass), pseudosteady-state flow, and finally the "diffusion" (or diffusivity) equations. At this point it is worth noting that we will have addressed the "fundamental" aspects of these building blocks — the assumptions, the limitations, and the need for advances in concepts for flow in porous media; and perhaps most importantly, the inherent non-linearities that exist for the "flow equations" used in Petroleum Reservoir Engineering.

In the last (and most important) portion of the course we consider the classic reservoir solutions for radial and linear flow, flow in fractured wells, flow in naturally-fractured (or dual porosity) systems, and the definition and use of convolution in reservoir engineering applications.

Assignments of PETE 620:
The assignments in this course vary from fundamental developments to solutions which could be used in reservoir engineering practice. Students are expected to demonstrate mastery of all fundamental concepts covered in the course. In addition, the instructor wishes to provide students with concepts, problems, and/or applications which will be useful for research.

The assignments for Fall 2013 are topically aligned as follows:

- Assignment 1 — Math and/or Petrophysics
- Assignment 2 — Pseudosteady-State and/or Diffusivity Equations
- Assignment 3 — Radial Flow, Fractured Wells and/or Dual Porosity
- Assignment 4 — Individual Projects

Philosophy about Life:
- **Most Appropriate Quote:**
  
  Opportunity is missed by most people because it is dressed in overalls and looks like work...
  
  Thomas A. Edison, American Inventor (1847-1931)

- **Important Rules for Life:**
  
  — Never own anything that eats while you sleep...
  — Never own anything that needs repainting…
  — Never own anything that you can't drive a nail in...
  
  — Always work harder than those you work for…
  — If you have to herd cats, then be a rat…
  — Never say no, and there's no limit to where you can go…

Brief Bio: Thomas A. Blasingame, Ph.D., P.E.

- Professor, Department of Petroleum Engineering at Texas A&M University in College Station Texas
- Holds a joint appointment in the Department of Geology and Geophysics at Texas A&M University
- Holder of the Robert L. Whiting Professorship in Petroleum Engineering
- B.S., M.S., and Ph.D. degrees in Petroleum Engineering from Texas A&M University.
- Teaching/Research activities:
  
  — Petrophysics
  — Reservoir engineering
  — Analysis/interpretation of well performance
  — Exploitation of unconventional reservoirs
  — Technical mathematics.
  
  — Technical Contributions:
  
  — Pressure transient test analysis
  — Analysis of production data
  — Reservoir management
  — Diagnostic characterization of reservoir performance
  — General reservoir engineering

- Student counts to date (Sep. 2013): 51 M.S. (thesis), 31 M.Eng. (report, non-thesis), and 10 Ph.D. students.

Guidance:

- **Orientation** — This is graduate school, the person you are competing against is in the mirror.
- **Work Quality** — My highest commandment is that you submit your best work; and ONLY your best work.
- **Focus** — This is an essential course in reservoir engineering, results are used throughout the discipline.
- **Timeliness** — This material is very "dense" — do not underestimate your workload and timing.
- **Be prepared; the material will teach itself, but you have to put your energy and enthusiasm into the course.**
- **I am here to help; I will answer any/all relevant correspondence quickly (within 24 hours if not totally offline).**