Computational Reservoir Geomechanics
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June 9-11, 2015
http://www.ems.psu.edu/~elsworth/courses/comp_res_geomechs/
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Day 1 (Tuesday June 9th, 2015)
1. Reactive Flow and Permeability Dynamics – I   [09:30-10:45]
2. Reactive Flow and Permeability Dynamics – II   [10:55-12:10]
       ------ Lunch -----   [12:10-13:30]
3. Introduction to Computational Reservoir Geomechanics [1:1]   [13:30-14:45]
4. Fluid Flow and Pressure Diffusion [2:-]
       a. Finite Element Methods [2:1]   [14:55-16:10]
       b. Conservation Equations and Galerkin Approximation [2:2]   [16:20-17:35]
       c. Self-Study – 2D Triangular Constant Gradient Elements [2:3]   [Self-Study]

Day 2 (Wednesday June 10th, 2015)
1. Geomechanics of Coal and Gas Shales   [09:30-10:45]
2. Fluid Flow and Pressure Diffusion, Continued [2:-]
       a. 1D Isoparametric Elements [2:4]   [10:55-12:10]
       ------ Lunch -----   [12:10-13:30]
       b. 2D Isoparametric Elements and Numerical Integration [2:5]   [13:30-14:45]
       c. Transient Behavior – "Mass" Matrices [2:6]   [14:55-16:10]
       d. Transient Behavior – "Integration in Time [2:7]   [16:20-17:35]
3. Mass Transport [3:-]
       d. Self-Study – Conservation of Mass and 1D Models [3:1]   [Self-Study]
       e. Self-Study – 2D Constant Gradient Elements [3:2]   [Self-Study]
       f. Self-Study – Sorption and Reactive Transport [3:3]   [Self-Study]
4. Momentum Transport [4:-]
       g. Self Study – Fluids, Navier-Stokes Equations [4:1]   [Self-Study]

Day 3 (Thursday June 11th, 2015)
1. Gas Fracturing in Unconventional Reservoirs   [09:30-10:45]
2. Solid Mechanics [5:-]
       a. 1D and 2D Elements [5:1]   [10:55-12:10]
       ------ Lunch -----   [12:10-13:30]
       b. Constitutive Equations [5:2]   [13:30-14:45]
3. "Coupled" Multiphysics Systems [6:-]
       a. Dual-Porosity/Dual-Permeability Models [6:1]   [14:55-16:10]
       b. Coupled Hydro-Mechanical Models [6:2]   [16:20-17:35]
       c. Self-Study – ComSol Models for HM Coupling [6:3]   [Self-Study]
       d. Self-Study – EGEEfem Models for HM Coupling [6:4]   [Self-Study]