Topic 1: *Drilling Operations in Abnormal Pressures.*

Topic 2: *Advanced Drilling Fluids.*

Topic 3: *Economics of Mineral Engineering.*

Topic 5: *Thermal Recovery.*

Topic 6: *Advanced Reservoir Engineering.*

Topic 7: *Two-Phase Flow in Pipes.*

Topic 8: *Extractive Metallurgy.*

Topic 9: *Modern Drilling.*

Topic 11: *Production Logging.*

Topic 12: *Near Wellbore Problems.*

Topic 13: *Advanced Well-Treatment Design.*

Topic 14: *Line Source and Sink Solutions.*

Topic 16: *Topics in Computational Methods.*
Same as Computational and Applied Mathematics 383 (Topic 2: *Topics in Computational Methods*).

Topic 17: *Naturally Fractured Reservoirs.*

Topic 18: *Near Wellbore Mechanics.*

Topic 20: *Geostatistics.*

Topic 22: *Magnetic Resonance Imaging/Computer Tomography Applications in Petroleum and Geosystems Engineering.*

Topic 24: *Natural Gas Engineering.*

Topic 25: *Data Acquisition and Analysis in Petroleum and Geosystems Engineering.*

Topic 26: *Environmental Solutions in Petroleum and Geosystems Engineering.*

Topic 27: *Rock Mechanics: Drilling, Completing, and Producing Applications.*

Topic 28: *Macroeconomics of Petroleum.*

Topic 29: *Rock Fracture Mechanics.*

Topic 30: *Multiphase Flow in the Near Subsurface.*

Topic 31: *Mathematics of Enhanced Oil Recovery and Remediation.*

Topic 32: *Hydraulic Fracture Design and Evaluation.*

Topic 33: *Advanced Drilling and Well Completion I.*

Topic 34: *Advanced Drilling and Well Completion II.*

Topic 35: *Advanced Production Engineering.*

Topic 36: *Advanced Numerical Methods.*

Topic 37: *Chemical Methods for Subsurface Characterization and Remediation.*

Topic 38: *Chromatographic Transport and Geochemical Modeling.*

Topic 39: *Design and Analysis of Pumping Systems.*

Topic 40: *Drilling Hydraulics.*

Topic 41: *Energy Finance.*

Topic 42: *Engineering Applications of Composition Mediated Information Systems I.*

Topic 43: *Engineering Applications of Composition Mediated Information Systems II.*

Topic 44: *Environmental Regulation of Oil and Gas.*

Topic 45: *Geomechanics of Subsurface Rocks and Fluids.*

Topic 46: *International Petroleum Concessions and Agreements.*

Topic 47: *Personal Computer-Based Applications in Petroleum and Geosystems Engineering I.*

Topic 48: *Personal Computer-Based Applications in Petroleum and Geosystems Engineering II.*

Topic 49: *Phase Behavior of Hydrocarbons.*

Topic 50: *Reservoir Applications of Foam.*

Topic 51: *Special Problems in Well-Logging.*

Topic 52: *Surface and Colloid Chemistry.*

Topic 53: *Constructing Knowledge Using the Internet.*
Offered on the letter-grade basis only. Additional prerequsite: Consent of instructor.

Topic 54: *Fundamentals of Rock Mechanics.*
The mechanical behavior of rock, brittle and ductile behavior, elasticity, time-dependent deformation, rock friction, fracture, and in situ stress. Applications to problems in petroleum and civil engineering and structural geology.