

Course Code

GE02

Course Name

Advanced Stratigraphy

Instructor

Dr. Ernest A. Mancini



Professional Career

Ernest A. Mancini is a Distinguished Research Professor in stratigraphy and petroleum geology in the Department of Geological Sciences at the University of Alabama. He joined the Department in 1976 where he teaches courses in advanced stratigraphy, carbonate sequence stratigraphy, sedimentary basin analysis, and petroleum geology to graduate students and courses in stratigraphy and petroleum geology to undergraduate students. He has supervised the research of or has served on the thesis and dissertation committees of scores of graduate students. Since 1998, he has served as the founding Director of the Center for Sedimentary Basin Studies at the University of Alabama. The Center is an interdisciplinary geoscientific research center that focuses on studies related to stratigraphy, sedimentology, sedimentary basins, petroleum systems and petroleum geology. The Center is especially recognized for its work on the Mesozoic interior salt basins in the Gulf of Mexico. From 1995-2007, he was the Regional Director of the Eastern Gulf Region of the Petroleum Technology Transfer Council (PTTC). The PTTC is an oil and gas technology transfer organization for industry. In this capacity, he coorganized technology and knowledge transfer workshops related to petroleum geoscience and petroleum engineering, and he conducted workshops in the areas of sequence stratigraphy, microbial carbonates, sedimentary basins, petroleum systems, and reservoir characterization and modeling primarily for independent oil and gas operators.

He served as the State Geologist and Director of the Geological Survey of Alabama and as the Oil and Gas Supervisor and Director of the State Oil and Gas Board of Alabama from 1982-1996. The State Oil and Gas Board of Alabama is a state oil and gas conservation and regulatory agency. The Geological Survey of Alabama is a state multidisciplinary scientific investigative agency. During his tenure with these two state agencies, rules and regulations for the exploration, development, and production for coal bed methane gas were promulgated for the state, and the first production of deep gas from Alabama coastal waters occurred.

He began his career as a petroleum exploration geologist for Cities Service Company in Denver, Colorado in 1974. His main areas of responsibility were to formulate an integrated stratigraphic framework for the Alaska Peninsula in preparation of a possible lease sale in the Bering Sea and to analyze and synthesize sedimentologic and paleontologic data obtained from core holes drilled in offshore California in anticipation of a lease sale in these waters.

Course Objective and Description

Examines the principles, concepts, methodology, and nomenclature of stratigraphy, and the application of stratigraphy to petroleum exploration and development. Lithostratigraphy, biostratigraphy, allostratigraphy, chemostratigraphy, chronostratigraphy, magnetostratigraphy, and sequence stratigraphy are studied. Stratigraphic units are examined in the field in surface exposures and/or in the laboratory on well logs and cores and seismic reflection sections.

The course is designed to provide hands-on experience in recognizing stratigraphic units in surface exposures and/or in the subsurface and in the application of stratigraphic concepts, methods and techniques that are important in local, regional and global correlation and facies analysis. Such experiences provide a framework for dividing the geologic record, interpreting the history of the earth, and in designing effective petroleum exploration and development strategies. Laboratory exercises involve core descriptions and environment of deposition interpretations; construction of an integrated chronostratigraphic framework for sedimentary basin analysis; subsurface correlation

using well logs integrated with seismic data; graphic correlation; the methodology of using paleontologic and well log data to recognize maximum flooding surfaces and sequence boundaries on seismic sections; selecting a sequence stratigraphic methodology (depositional sequences, genetic stratigraphic sequences, or transgressive-regressive sequences) to recognize and characterize the components of a petroleum system, including potential reservoir, source, and seal rocks using a systems tract approach; and a field and reservoir characterization study.

Who Should Attend

Students interested in learning advanced stratigraphic methodologies, including sequence stratigraphic approaches, and their application in sedimentary basin studies and petroleum exploration and development.



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Prerequisite

B.S. degree, including an undergraduate course in stratigraphy

Learning Level

Graduate-MS/PhD level

Duration

5 days

Course Material

Handouts

Course Outline

Day One-Part 1

- Introduction to stratigraphy
- Stratigraphic principles & concepts

Day One-Part 2

- Stratigraphic Nomenclature
 - o Lithostratigraphy
 - o Biostratigraphy
 - o Allostratigraphy
 - o Chemostratigraphy
 - o Chronostratigraphy
 - o Magnetostratigraphy

Day Two

- Methodology & Techniques
 - o Outcrop data and/or well log data
 - o Seismic data
 - o Graphic correlation
 - o Methodology of using paleontology and well log data to recognize maximum flooding surfaces and sequence boundaries on seismic sections