

Course Code

GE03

Course Name

Advanced Methods in Structural Geology

Instructor

Dr. brahim Çemen



Professional Career

Dr. Çemen is the Chair of the Department of Geological Sciences at the University of Alabama since August 2009. He is also the director of southeastern region of the Petroleum Technology Transfer Center of the American Association of Petroleum Geologists. He received his Ph. D. in Geology from the Pennsylvania State University in 1983. After a one-year visiting assistant professor position at Ohio University, he started as an Assistant Professor at Oklahoma State University in 1984. He was awarded an early tenure and promotion to Associate Professor in 1987 and became a full professor in 1993. He was at the Middle East Technical University from August 1989 to December 1991. He also served as the Department Head at Oklahoma State University Boone Pickens School of Geology from 2001 to 2005. Dr. Çemen is a petroleum structural geologist. His major research interests are a) oil and gas exploration in sedimentary basins; b) structural styles formed in contractional, extensional and strike-slip terranes. Since 1986, he has been conducting research in determining oil and gas potential of sedimentary basins in Oklahoma and in Turkey. Since 1999, his research group has been studying the extensional basins in Western Turkey. He has authored 47 archival referred articles; edited 2 books, wrote 19 technical reports and delivered 163 presentations (57 invited). His work has been cited over 500 times in geological journals scanned by the Science Citation Index. He has received various grants and contracts totaling to over \$5,000,000 from major oil and gas companies, and from federal and state funding agencies including the National Science Foundation of the United States (NSF). He taught three summer courses with TOKTEN grants in Turkey. He also spent a sabbatical in Ankara University in 1999. He was awarded the Myron Sturgeon visiting scholar award of the Ohio University in 2006 when he was on sabbatical. He is a fellow of the Geological Society of America, active member of American Association of Petroleum Geologists and member of Turkish Petroleum Geologists Association.

Course Objective and Description

The main purpose of this course is to teach the use of geometric techniques involved in solving structural problems. These techniques will be used to solve problems associated with published and unpublished geological maps depicting different structural styles. Use of seismic reflection profiles and other subsurface data in structural geology and use of personal computers in structural geology will also be covered.

Who Should Attend

Exploration structural geologist working in structurally complex areas

Prerequisite

An Undergraduate structural geology course

Learning Level

Post undergraduate

Duration

5 days

Course Material

Notes prepared by the instructor

Course Outline

Day One

- Structure contours
- Three-point problem
- Rock units separated by an unconformity
- Finding structural position of rock pre-unconformity
- Structure contour maps above and below the unconformity
- Rock units separated by a normal fault.

Day Two

- Outcrop patterns of folded rock units
- Structure contour maps in highly folded terranes
- Thrust fault and fold geometry
- Structure contour maps in highly folded terranes

Day Three

- Subsurface structural geology, using logs to determine faults
- Fault counter maps
- Structure contour maps with fault gaps
- Structure contour maps with intersecting faults

Day Four

- Concept of cross-section balancing
- Section balancing and hydrocarbon exploration
- Assumptions of cross-section balancing
- Seismic expression of fold-thrust belt
- Exercise in compressional structures
- Construction of balanced cross-sections

Day Five

- Extensional structures
- Seismic expression of extensional structures
- Cross-section balancing and extensional structures
- Strike-slip (Wrench) structures
- Seismic expression of strike-slip structures
- Exercise in strike-slip structures

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