

**Course Code**

GC03

**Course Name**

**Quantitative Basin Modeling in Petroleum  
Exploration and Exploitation**

**Instructor**

Dr. M. Arif Yüklér



**Professional Career**

Dr. Yüklér has 38 years of oil-industry experience and is a renowned international expert in the areas of petroleum exploration, exploitation and operation. Dr. Yüklér is the founder of deterministic dynamic basin modeling in 1-, 2- and 3- dimensions. The applications of YUKLER quantitative basin modeling software have resulted in the discovery of more than 100 new oil and gas fields. He received in 1971 M.S. in Petroleum Engineering from Istanbul Technical University and received his M.S. in Geology in 1974 and PhD in Hydrogeology in 1976 from the University of Kansas. He was a Fullbright Scholar at the University of Kansas. Dr. Yüklér has held a variety of technical positions with Shell Oil Company, Kansas Space Technology Centre, Kansas Geological Survey, Julich Nuclear Research Centre, Phillips Petroleum, Integrated Exploration Systems, Integrated Basin Analysis Inc, Frontera Resources and Midland Oil and Gas. Dr. Yüklér has served as a top advisor on the exploration and development of energy resources to the governments of Japan, China and Turkey. He has worked on numerous projects covering practically all the known basins of the world on behalf of Norsk Hydro, Statoil, Danish Geological Survey, Conoco, Arco, Pennzoil, Turkish National Petroleum Corporation, Austrian National Oil Company (OMV), Petrobras, Maxus, Japan National Oil Corporation, Idemitsu, READ Geological Services, Dow Geochemical Services Inc., Nopec Shengli Oil Company (PRC), Daqing Oil Company (PRC), United Meridien Oil Company, Saudi Aramco and Riso Research Center (Denmark). Dr. Yüklér also taught quantitative basin modeling and exploration and exploitation techniques in the North Sea at the University of Bergen, Norway, as a Nordic Ministerat Professor. Dr. Yüklér has authored more than 40 referred technical papers in quantitative basin modeling, evaluation of hydrocarbon potential of basins, sensitivity analysis, hydrodynamics, geothermics, diffusion of gases and remote sensing. He is an active member of American Association of Petroleum Geologists. Additional information on Middle East studies.

1978-1981 3-dimensional dynamic modeling of Abu Dhabi onshore and offshore to determine the quantitative hydrocarbon potential of the area by identifying all the possible conventional and unconventional traps and the hydrocarbon contents of each trap on behalf of ADMA, ADNOC, ADCO, Shell, BP, Mobil and Exxon.

1986-1988 Quantitative evaluation of Gulf of Suez and determination of quantitative hydrocarbon potential of the Nile Delta on behalf of Maxus

1989 Determination of the quantitative hydrocarbon potential of the Cretaceous sand reservoirs in Yemen on behalf of Maxus

1989-1993 Determination of quantitative hydrocarbon potential of Golf of Gabes and Golf of Hamammet and Ghadames Basin on behalf of ETAP

1989-1992 Determination of quantitative hydrocarbon potential of Central Libya and Ghadames Basin in Libya on behalf of OMV

1992-1993 Determination of quantitative hydrocarbon potential of Iraq's western desert on behalf of Turkish Petroleum Corporation

2002-2003 Determination of quantitative hydrocarbon potential and paleo-hydrodynamics of the Qawar Area on behalf of Saudi Aramco

2007 Determination of quantitative hydrocarbon potential of northern Iraq on behalf of Frontera Resources

**Course Objective and Description**

This course teaches fundamentals of quantitative basin modeling to Geologist, petroleum engineers, managers, executives and geophysicist. Development of basins in terms of tectonic, depositional environment and sedimentation is also considered since those terms control the oil and gas habitat in the basins. Hydrology, geothermic and organic geochemistry are integral part of this course. Sensitivity of input parameters is discussed. Examples from various basins are given. Risk analysis and petroleum economics are thought delicately in an understandable manner.

**Who should Attend**

Geologist, petroleum engineers, managers, executives and geophysicist

**Prerequisite**

Sufficient geology background

**Learning Level**

Intermediate

**Duration**

3 Days

**Course Material**

Handouts and course material

**Course Outline**

*Day One*

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- General Concepts in Quantitative Basin Modeling
  - o History of Basin Modeling
  - o Modeling Techniques
  - o Statistical
  - o Deterministic
- Art of Deterministic Dynamic Modeling
- Basin Evolution in Terms of Tectonics, Depositional Environment and Sedimentation
- Hydrogeology
- Hydrologic Cycle
- Physical and Chemical Properties of Water
- Petrophysical Properties of Sediments
- Theory of Water Flow
- Flow of Fluids in a Deformable Porous Media
- Compaction of Sediments
- Hydrostatic, Abnormal and Subnormal Pressures
- Effects of Fluid Flow on Diagenesis of Sediments

*Day Two*

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- Geothermics
- Concepts and Fundamental Terms
- Thermophysical Properties of Sediments
- Modes of Heat Transfer
- Tectonics and Terrestrial Heat Flow
- Quantitative Thermal Modelling
- Organic Geochemistry
- Chemical Properties of Organic Matter

*Quantitative Basin Modeling in Petroleum Exploration and Exploitation*

- Maturity Indicators
- Generation Indicators
- Reservoir Geochemistry
- Quantification of Maturity of Organic Matter and Generation of Hydrocarbons
- Migration and Accumulation of Hydrocarbons
- Optimization and Checking Parameters in Quantitative Basin Modeling
- Parametric Sensitivity Analysis

*Day Three*

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- Application of Basin Modeling under Different Tectonic and Geologic Settings
  - Risk Analysis
  - Petroleum Economics
  - CAPEX
  - OPEX
  - Modelling for ROR, NPV, etc
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Ankara, Turkey  
 12-14 Apr  
 6-8 Sep  
 US\$ 1,420

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