This course features . . .

- An appropriate balance will be maintained between lectures and problem solving, and between theory and application.
- Problem-solving sessions are dispersed throughout the course to enhance the understanding of variables unique to two-phase flow.
- Computer algorithms are presented so that you will be able to develop your own programs upon completion of the course.
- You will receive the SPE monograph on "Multiphase Flow in Wells" and an extensive workshop manual.
- A "get acquainted" reception will be held Monday at the end of class.
- A scientific calculator will be provided.

This course is designed for . . .


A familiarity with basic fluid mechanics and fluid properties is necessary. You should also be familiar with hydrocarbon systems vapor-liquid equilibrium and computer programming. No previous experience in two-phase flow is required.

Instructors

Dr. Cem Sarica, Professor of Petroleum Engineering at The University of Tulsa (TU) holds a Ph.D. in Petroleum Engineering from TU. His current research interests are multiphase flow in pipes, oil and gas production, and flow assurance. He has authored several publications on these subjects. Since receiving his Ph.D. degree, he has worked for Istanbul Technical University (ITU) as an Assistant Professor of Petroleum Engineering, TU as the Associate Director of Tulsa University Fluid Flow Projects (TUFFP), and The Pennsylvania State University (PSU) as Associate Professor of Petroleum and Natural Gas Engineering in the Energy and Geo-Environmental Engineering Department. He is currently serving as the director of TUFFP and Tulsa University Paraffin Deposition Projects (TUPDP). He has taught several courses in multiphase flow in pipes, and oil and gas production at TU, PSU, and TU.

Dr. James P. Brill, Professor Emeritus and Research Professor of Petroleum Engineering at The University of Tulsa (TU), is a recognized authority on behavior prediction and applications for multiphase flow in pipes and paraffin deposition. Since receiving a Ph.D. degree in Petroleum Engineering from the University of Texas, he has worked for Chevron Oilfield Research Company and Amoco Production Company’s Research Center, in addition to TU. He has numerous publications on multiphase flow and other areas of Petroleum Engineering and is coauthor of the SPE Monograph on Multiphase Flow in Wells that serves as the primary text for the short course. At TU, he has been actively engaged in teaching, research, and consulting in multiphase flow, and is the founder and director emeritus of TUFFP and TUPDP.

Enrollment Information

To enroll, complete and return the attached enrollment form with your payment to: The University of Tulsa, Continuing Engineering Education, 800 South Tucker Drive, Tulsa, OK, 74104-3189, USA or fax to: 918-631-2154 or call: 918-631-3088 or Email: cese@utulsa.edu or Online: www.cese.utulsa.edu (credit card payments only)

Confirmation of enrollment will be sent to you by email prior to the course.

SEMINAR FEE: The seminar fee covers the cost of all sessions, handout materials, textbook, workshop manual, TU Campus Visitor Parking Permit, reception and daily refreshments. The fee is to be paid in net U.S. dollars.

MEMBER COMPANY DISCOUNT: Available to those companies enrolled in TUFFP (Tulsa University Fluid Flow Projects) and TUPDP (Tulsa University Paraffin Deposition Projects).

GROUP DISCOUNT: Available to groups of two or more attending from the same company location.

EARLY ENROLLMENT: Sign-up for the short course before April 5, 2013 to receive this discounted rate.

All paid seminar fees will be refunded in the unlikely event the course is canceled. Those who cancel ten working days or less prior to the seminar will receive a refund less an administrative fee of $125. Refunds will not be granted after class has begun or for nonattendance. Substitutions are permitted at any time.

Principles of Two-Phase Flow

- Conservation laws
- Mechanical energy balance equation
- Heat balance equation
- Evaluation of friction losses
- Two-Phase Flow Introduction
- Definition of basic variables
- Two-phase flow pressure gradient equation
- Flow patterns
- Computing algorithms

PVT Properties

- Mass Transfer Models
  - Black oil model
  - Compositional model
- Density of Oil, Water, Gas
- Viscosity of Oil, Water, Gas, Emulsions
- Surface Tension

Flow in Wells

- Flow Pattern Prediction Modeling
- Pressure Loss and Holdup Prediction – Models and Correlations
- Evaluation of Pressure Loss Methods

Flow in Pipelines

- Flow Pattern Prediction Modeling
- Pressure Loss and Holdup Prediction – Models and Correlations
- Evaluation of Methods
- Effects of Hilly Terrain
- Slug Flow Modeling

Flow Through Restrictions

- Basic Equations
- Critical vs. Subcritical Flow
- Critical Flow Correlations
- Subcritical Flow Correlations

Unified Modeling

- Model Development
- Model Evaluation

Flow Assurance

- Wax Deposition
  - Deposition Modeling
  - Prevention and Remediation
- Severe Slugging
  - Phenomena
  - Mechanisms
- Elimination Methods
Registration Form

Please enroll the following in the April 29 - May 3, 2013 • Tulsa, Oklahoma offering of FLUID FLOW PROJECTS: “TWO-PHASE FLOW IN PIPES” Short Course.

Name ______________________________________________________________

Title ________________________________________________________________

Company __________________________________________________________

Address ____________________________________________________________

City_________________________ State ________________________________

Zip______________________ Country __________________________________

Phone (_____________) ______________________________________________

Fax (___________) ___________________________________________________

Email ______________________________________________________________

Enroll on-line! www.cese.utulsa.edu

TUFFP & TUPDP Member Company Fee Schedule:
- $2,595 per person - regular tuition (net U.S. dollars)
- $2,395 per person - early enrollment or group discount (net U.S. dollars)

Non-Member Company Seminar Fee Schedule:
- $2,995 per person - regular tuition (net U.S. dollars)
- $2,795 per person - early enrollment or group discount (net U.S. dollars)

Method of Payment:
- Check enclosed. Make payable to The University of Tulsa, CESE
- Charge my credit card.
  - VISA
  - MasterCard
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Card Number _________________________________________________________

Expiration Date ______________________________________________________

Name on Card _________________________________________________________

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The University of Tulsa, CESE
800 South Tucker Drive, Tulsa, OK  74104-3189 USA

FAX: 918-631-2154

CALL: 918-631-3088

EMAIL: cese@utulsa.edu

What is TUFFP?
The Tulsa University Fluid Flow Projects (TUFFP) is a cooperative industry-university research group supported by more than 15 oil and gas production, service companies and government agencies from 10 countries. The group was formed January 1, 1973, to conduct applied research on fluid flow problems encountered by the member firms. Research is supported by $800,000 annual membership fees. Most of the current research projects involve experimental studies of multiphase flow in pipes. Short courses on the design of two-phase flow in piping systems for oil and gas production and transportation are among the services offered by TUFFP to member and nonmember firms.