It is known that offshore activity for the petroleum industry emphasizes subsea completions with full wellstream flow in much longer flowlines. Thus, an improved understanding of multiphase flow in wells, flowlines, and risers is of vital importance. This course gives you that understanding!

Fundamentals of two-phase flow in piping systems encountered in the production and transportation of oil and gas is the course’s focus. The completed and current research projects conducted at the Tulsa University Fluid Flow Project (TUFFP) permits teaching the latest techniques for designing multiphase flow systems.

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 . . .

Course Pre-Requisites: 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.

DATE, TIME AND LOCATION
May 16–20, 2016 • Tulsa, Oklahoma
Doubletree Hotel, 6110 S. Yale, 918-495-1000
The short course is scheduled from 8:30 a.m. to 5:00 p.m. Monday–Thursday and from 8:30 a.m. to noon on Friday.

HOTEL RESERVATIONS: A blocking of sleeping rooms has been reserved at the hotel for participants attending this course needing overnight accommodations. Contact the hotel directly at 1-800-801-1317, and specify you are with TU Flow in Pipes Short Course. To receive the discounted group rate of $97, reservations must be made before April 15, 2016.

INSTRUCTORS

Dr. Cem Sarica, E.H. “Mick” Merelli/Cimarex Energy 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, Tulsa University Paraffin Deposition Projects (TUPDPP) and Tulsa University Horizontal Well Artificial Lift Projects (TUHWALP). He has taught several courses in multiphase flow in pipes, flow assurance and oil and gas production at ITU, PSU, and TU.

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R. Sutton, Sr. Technical Consultant, Marathon Oil

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COURSE OUTLINE

Principles of Two-Phase Flow
- Single-Phase Flow Review
  - 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

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Registration Form

Please enroll the following in the May 16-20, 2016 • Tulsa, Oklahoma offering of FLUID FLOW PROJECTS: “TWO-PHASE FLOW IN PIPES" Short Course.

Name ______________________________________________________________
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Company __________________________________________________________
Address ____________________________________________________________
City___________________________________State________________________
Zip________________________________ Country ________________________
Phone (_____________) ______________________________________________
Email ______________________________________________________________

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

Course Fee Schedule (price in net U.S. dollars)
TUFFP & TUPDP Member Companies:
☐ $2,595 per person - early enrollment discount (available
  until April 15, 2016)
☐ $2,595 per person - group discount
☐ $2,795 per person - regular tuition

Non-Member Companies:
☐ $2,995 per person - early enrollment discount (available until April 15, 2016)
☐ $2,995 per person - group discount
☐ $3,295 per person - regular tuition

Method of Payment:
☐ Check enclosed. Make payable to The University of Tulsa, CESE
  Charge my credit card.
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Contact us at:
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

Announcing the 41st offering of

Fluid Flow Projects:
TWO-PHASE FLOW IN PIPES
A State-of-the-Art Short Course

May 16-20, 2016
Tulsa, Oklahoma

Instructors:
Dr. Cem Sarica
Dr. Eduardo Pereyra

What is TUFFP?
The Tulsa University Fluid Flow Projects (TUFFP) is a cooperative industry-university research group supported by more than 18 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 $1,000,000 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 non-member firms.