The New IPIMS
Content Releases
June 1, 2019

Hydrocarbon Indicators
Risk Analysis Applied to Petroleum Investments
Seismic Interpretation of Shales
Hydrocarbon Indicators

- Seismic Methods and Hydrocarbon Detection
- Reflections and Seismic Parameters
- Seismic Attributes and Their Preservation
- Amplitude HCIs
- Amplitude Versus Offset (AVO)
- Seismic Modeling
- Shear Waves and Other Hydrocarbon Indicators
Risk Analysis Applied to Petroleum Projects

- Risk Analysis Fundamentals
- Probability Distributions
- Monte Carlo Simulation Models
- Competitive Bidding and Enterprise Risk Management
Seismic Interpretation of Shales

- Unconventionals
- Seismic Attributes
- Geometric Attributes
- Fracture Monitoring With Microseismic
The New IPIMS
Planned Content Releases
Q3/4 2019

Oil and Gas Pipelines
Reservoirs
Resources and Reserves Estimation
Well Log Interpretation Essentials
Perforating
Sand Control
Traps
Seismic Stratigraphic Modeling
Specialized Well Log Interpretation
The New IPIIMS
Content Released
2018

Seismic Contouring
Coring
Core Analysis
Logging Equipment and Procedures
Overview of Formation Evaluation
Fault Interpretation
Completion Equipment
Hydrocarbon Generation and Migration
Velocity Interpretation and Depth Conversion
Completion Equipment (December 2018)

- Completion Tubulars Overview
- Completion Tubulars Design
- Packers
- Seals and Elastomers
- Downhole Completion Accessories for Unconventional Oil and Gas Developments
- Downhole Completion Accessories for Flowing and Gas-lifted Wells
- Equipment for Low Rate, Pumping Wells
- Upper completion equipment (SSSV & Wellheads)
Core Analysis (November 2018)

- Introduction to Core Analysis
- Core Sample Preparation
- Porosity Measurement
- Permeability Measurement
- Fluid Saturation Determination
- Complementary Core Information
- Core Reports
- Special Core Analysis
Velocity Interpretation and Depth Conversion

- Seismic Velocities
- Normalized Interval Velocity
- Well Velocities
- Seismic Velocity Databases
- Time-Depth Conversion Methods
- Normalized Interval Velocity Techniques
- Error Factors
- Other Methods (Additional Examples) for Time-Depth Conversion
Hydrocarbon Generation and Migration

- Generation and Maturation Processes
- Migration Processes
Seismic Contouring

- Contouring Fundamentals
- Contouring by Hand: Picking
- Contouring by Hand: Solving Misties
- Contouring by Hand: Practical Procedures
- Contouring by Machine
- Contour Maps: Operations
Coring

- Introduction to Coring
- Borehole Environment
- Full Diameter Conventional Coring
- Sidewall Coring
Logging Equipment and Procedures

- Wireline Logging Equipment
- Wireline Logging and Operational Procedures
- Logging While Drilling (LWD) Equipment and Operational Procedures
Overview of Formation Evaluation

- Fundamentals of Formation Evaluation and Subsurface Evaluation
- Fundamentals of Rock and Fluid Properties and their Measurement by Logging Tools
- Fundamentals of Laboratory Measurements of Rock and Fluid Properties
- Fundamentals of Well Testing and Analysis
Fault Interpretation

- Faults in Petroleum Provinces
- Stress and Strain
- Fault Nomenclature
- Seismic Expression of Faults
- Fault Data Interpretation
- Divergent Basins: Structural Styles
- Convergent Basins: Structural Styles
- Faults: 3D and Workstation Interpretation

From Lowell et al., reprinted with permission of AAPG

Courtesy of LMKR GeoGraphix
The New IPIMS
Previously Released Content
June 16\textsuperscript{th}, 2017

Basic Completion Design and Practices
Basic Seismic Interpretation
Introduction to Unconventional Resources
Basic Completion Design and Practices

- General Criteria for Completion Design
- Basic Downhole Configurations
- Lift Methods and Completion Design
- Specialized Completion Designs
- Completion Productivity and Injectivity
- Completion Planning
Introduction to Unconventional Resources (NEW)

- Introduction to Unconventional Resource Types
- Introduction to Unconventional Resource Development
- Shale Reservoirs
- Tight Gas Sands and Their Development
- Coal Bed Methane Reservoirs and their Development
- Extra-Heavy Oil Resources
The New IPIMS
Previously Released Content
January 13th, 2017

Dipmeter Surveys
Gravity and Magnetics
Hydraulic Fracturing
Petroleum Geomechanics
Dipmeter Surveys

Outline

• Dipmeter Overview
• Dipmeter Logging Tools
• Raw Dipmeter Data Processing
• Display of Formation Dip and Image Data
• Dipmeter Interpretation of the Geological Structure
• Dipmeter Interpretation in Various Depositional Environments
• Dipmeter Applications for Unconventional Resource Reservoirs
Gravity and Magnetics

Outline

- Introduction to Gravity and Magnetics
- Density of the Earth
- Modeling the Gravity Effects of Geologic Bodies
- Reduction and Processing of Gravity Data
- Surface Gravity Interpretation
- Borehole Gravity
- Gravity Gradiometry and Time-Lapse Gravity Measurements
- Introduction to Magnetic Data
- Magnetic Anomalies: Their Geological Significance and Signatures
- Magnetic Instruments and Field Surveys
- Magnetic Data Processing and Interpretation
Hydraulic Fracturing

Outline
- Hydraulic Fracturing Fundamentals
- Hydraulic Fracturing Fluids
- Proppants
- Fracturing Equipment and Operations
- Fracture Treatment Design
- Hydraulic Fracturing Treatment Evaluation
Petroleum Geomechanics

Outline

• Fundamental Concepts of Geomechanics
• Rock Deformation
• Rock Mechanical Properties
• Earth Stress
• Mechanical Earth Model
• Applications of Geomechanics
The New IPIMS
Previously Released Content
October 14th, 2016

Fluid Flow and the Production System
Seismic Reflection
Subsurface Environment
Fluid Flow and the Production System

Outline

• Production Systems
• Inflow Performance Relationship
• Lift Performance
• Flowing Well Performance
• Production Rate Decline Curves
Seismic Reflection

Outline

• Reflection Theory
• Diffuse Refractions and Multiples
• Reflection and Geologic Interfaces
• Refraction Theory and Non-Normal Incidence
Subsurface Environment

Outline

• Water Origins and Chemistry
• Temperature and Thermal Gradients
• Pressure Environments
The New IPIMS
Previously Released Content
May 16th, 2016

Slickline Well Intervention (NEW)
Coiled Tubing Well Intervention (NEW)
Plate Tectonics and Sedimentary Basins
Seismic Pulse
Outline

• Overview of Slickline Well Intervention
• Basic Slickline Equipment
• Slickline Service Tools
• Subsurface Flow Controls
• Advanced Slickline Applications
• Slickline Operations
Coiled Tubing Well Intervention (NEW)

Outline

• Overview of Coiled Tubing Well Intervention
• Basic Coiled Tubing Equipment
• Coiled Tubing Downhole Tools
• Coiled Tubing Operations
**Plate Tectonics and Sedimentary Basins**

**Updates**
- Reorganized Subtopics
  - 6 Subtopics combined into 3 Subtopics
- New and Updated Graphics

**Outline**
- Introduction to Plate Tectonics and Sedimentary Basins
- Plate Tectonics
- Sedimentary Basins
Seismic Pulse

Updates
- Formerly “Seismic Pulse Generation and Transmission”
- Reorganized Subtopics
  - 9 Subtopics combined into 4 Subtopics
- New and Updated Graphics

Outline
- Source Signal Theory
- Attributes of the Seismic Pulse
- The Propagating Pulse
- Seismic Ray Theory
2015 Content Releases

Released 2016:

- Petroleum Geology
  - Petroleum Geomechanics
  - Plate Tectonics and Sedimentary Basins
  - Subsurface Environment

- Petroleum Geophysics
  - Gravity and Magnetics
  - Seismic Pulse
  - Seismic Reflection

- Petroleum Engineering
  - Fluid Flow and the Production System
  - Hydraulic Fracturing
  - Slickline Well Intervention (NEW)
  - Coiled Tubing Well Intervention (NEW)

- Formation Evaluation
  - Dipmeter Surveys

Released in 2015:

- Petroleum Geology
  - Fundamentals of Petroleum Geology
  - Structural Geology
  - Hydrocarbon Properties

- Petroleum Geophysics
  - Fundamentals of Exploration Geophysics
  - Signal Theory: A Graphical Introduction
    (previously “Geological Messages in the Seismic Trace”)

- Petroleum Engineering
  - Artificial Lift Methods
  - Cementing
  - Electric Line Well Intervention (NEW)
  - Overview of Rigless Well Intervention (NEW)
The New IPIMS
Navigation and New Features Guide
IPIMS Log In Page

Welcome to IPIMS!

IPIMS is the award-winning, interactive multimedia and leading e-Learning system for building competencies in Upstream Petroleum Technology.

IPIMS includes over 1057 courses in 158 E&P topic areas and provides a comprehensive and flexible learning system that can be tailored to meet each individual’s specific needs.

The courses are designed around two levels of learning: Background Learning and Action Learning. Each level includes extensive content, award-winning video, and challenging interactions and self-assessment questions.

Use the options below to search or browse the complete IPIMS Course Catalog. You can also download IHRDC’s detailed 330+ page e-Learning Course Catalog PDF file.

Click the icons below for more information.

IPIMS e-Learning Course Catalog HTML Document

IHRDC Detailed e-Learning Course Catalog (PDF High 12.9 MB)

IHRDC Announces Upgrade to its IPIMS e-Learning System
The new IPIMS Portal page directs the user to select one of two options given below.

Background Knowledge  Background Learning and Action Learning
Welcome Dave

To enhance your learning and development resources, we have licensed IHRDC's e-Learning system, which focuses on exploration and production technology. We are pleased to announce that this innovative learning system, known as IPIMS (International Petroleum Industry Multimedia System) is now available as an online reference tool and training package.

Browse our comprehensive library of E&P knowledge, concepts and practices.
Background Knowledge

- Updated Search Engine functionality

IPIMS users can now ‘Search Knowledge’ pages using Keywords…

…and ‘Browse by Discipline.’
When **Browsing by Discipline**, filter by:

- Pages
- Images
- Videos
- Interactives
The left menu Subject Listing bar allows the User to easily navigate through multiple pages within a given Subtopic.
‘Select a Learning Plan’ in the New IPIMS

Welcome Dave

To enhance your learning and development resources, we have licensed IHRDC’s e-Learning system, which focuses on exploration and production technology. We are pleased to announce that this innovative learning system, known as IPIMS (International Petroleum Industry Multimedia System) is now available as an online reference tool and training package.

Quick Search Across IPIMS Knowledge & Learning

BACKGROUND KNOWLEDGE

BROWSE OUR KNOWLEDGE

Browse our comprehensive library of E&P knowledge, concepts and practices.

SELECT A LEARNING PLAN

Choose from over 900 self-guided IPIMS e-Learning courses.
Select your navigation choice.

Begin by making your Learning selection, either **Background Learning** and/or **Action Learning**.

Then, filter by **Discipline**.
Background Learning – Select a Topic

- Background Learning’s new features employ interactive content elements within:
  - Subject pages
  - Knowledge Checks
  - Assessment Questions

- The new interactive content elements are designed to:
  - Engage the learner
  - Increase learning retention

Finally, select your **Topic** and begin your course!
New Background Learning User Interface

- Instructionally designed to:
  - Increase learning retention
  - Provide a newer look and feel

- Tablet-friendly interface
Topic Level View in IPIMS Background Learning

Cementing
Introduces the chemistry and classification of oil well cements. Discusses the use of additives, API testing requirements, and slurry flow properties. Describes cementing equipment, procedures, and evaluation techniques for primary and remedial cementing.

Subtopics in Cementing:
1. Introduction to Cementing
2. Chemistry and Classification of Oilwell Cement
3. Additives
4. Cement Testing Procedures
5. Cement Slurry Flow Properties and Mud
6. Cementing Equipment
7. Primary Cementing
8. Squeeze Cementing
9. Plug Cementing
10. Cement Evaluation

Clearer Navigation of Subtopics within a Topic.
Helpful Tips & Tricks

- See all the **notes** you have taken for the Subtopic within this Topic. Notes are saved at the Topic level.
- Once you complete the Topic, you will be able to print a **Certificate of Completion**.
- See the overall **Topic status** as you progress through the Subtopics.
If you need help at any point, simply click on **Show Tips** within the **Help** options for convenient tips to guide you through a course.
Click the **Start** button to view Learning Objectives and then continue on to the first subject listing.
Helpful In-Progress Resources

Write your own course notes. You can also view notes from the topic level.

Provide feedback and comments on this course.

Increase text size for easier viewing.

Expand or collapse this tool bar.

Go back to the topic level.

How to Use This Course

Complete each subject and then complete the assessment (required for course completion).

You may repeat the assessment up to two times.

START
In-Course Navigation

Click the lock icon to keep this left menu bar displayed as you go through the course. Click the unlock icon to collapse the menu bar.

List of subjects in the course. Click a subject name to navigate to it or use the page forward & back icons on the subject screen.

After completing the assessment, please take a moment to rate this course.

Take the course assessment once you have completed reading through the subjects.

View the references used in this Topic.

Go back to the Topic level.
Updated Video Player

New video player available in three different sizes (shown here: small) with corresponding cc text and transcript.

Navigation bar: move forward and backwards within a course.
Updated Video Player

Medium size video player, with the transcript below for better reading.

Full screen size video player.
New Feature: Subject Page Interactives

Animation

Multi – Image Media Panel

Popover Images
New Feature: Knowledge Checks

Knowledge Checks are optional questions presented at the end of each Subject page and designed to reinforce key concepts and learnings in the content, through various question formats.

Constructive feedback is provided, re-enforcing a correct answer or explaining why an answer is incorrect.
New Feature: Assignment and Draft Pad

Draft Pad is available to write down your solution during Exercises or Assignments. Notes in the Draft Pad are not saved for later use.

Industry-specific scenario based Assignment to apply Learning content.
Navigating Assessments

Click the Assessment Status pop-up panel to seamlessly navigate through the assessment questions.

Highlighting makes it clear which questions remain unanswered.

Because the density of sedimentary rock is about 2.5 x that of water, the pressure gradient imposed by the weight of the overburden is estimated to be about \( \frac{250}{10} \) psi/ft of depth.

A. 2
B. 1
C. 3
D. 4
Background Learning: Interactive Assessments

Assessment Questions, and their variety of formats, make for more engaging learning which improves the ability to assess the learner’s knowledge of more complex content.
After completing the Assessment, you are able to review your Assessment answers or rate the course.
Course Completion

Your **Topic** progress will update as you complete each **Subtopic**.

**Subtopic grades and progress are clearly marked**
IPIMS Action Learning 3.2
The New IPIMS Action Learning
The New IPIMS Action Learning

Production Optimization

In this Learning Module, you will review the actual performance of Well SAI-SW, as well as that of several other wells in offsetting fields, in an effort to optimize their production rates. By the time you complete this module, you should be able to analyze well behavior using nodal analysis and historical production trends, diagnose equipment problems and/or detect production deviations, and recommend the appropriate action for optimizing production.

Well SAI-SW has been completed in the Upper Muskeg sands, and a production and buildup tests have been completed. You now need to see if the well’s actual performance matches what was predicted before its completion. You will be looking for ways to optimize the well’s production under both current and future reservoir conditions. You will also look at other wells, including two that are currently producing using electric submersible pumps and one that is planned as a not pump completion, and make recommendations regarding their performance.

Subtopics in Production Optimization:

- Productivity Index and Flow Efficiency
- Stimulation Planning
- Well Performance Optimization, Part 1
- Well Performance Optimization, Part 2

Estimated Topic Duration: 8h

Course Status Details

Not Started

IHRDC
Helpful tips
The New IPIMS Action Learning

How to Use This Course

- Read through the Assignment Instructions
- Complete the assessment (required for completion). You may repeat the assessment up to two times.
- At any point during the course, you can access related IPIMS material by clicking on the BACKGROUND button on the top right of the screen.
- Action Learning REFERENCES are an essential resource — there you will find the field data and other information needed to complete the Assignment.

Resources always available

START
Click here to go to the General Assignment Instructions.
The New IPIMS Action Learning: Resources

Improved views of references and background knowledge
The New IPIMS Action Learning: References

Flow Equations

Equations for Flow of Undersaturated Oil

1. Steady state, radial flow:

\[ P_s - P_wf = \frac{141.2 \pi \varepsilon}{k h} \left( \ln \frac{r_s}{r_w} + \varepsilon \right) \]

Applications: Constant pressure at outer drainage boundary (e.g., pressure maintenance by an aquifer).

2. Semi steady state, radial flow:

\[ P_s - P_wf = \frac{141.2 \pi \varepsilon}{k h} \left( \ln \frac{r_s}{r_w} + \varepsilon \right) \]

Applications: Non-consistent pressure at outer drainage boundary (e.g., fault, pinchout, or production from adjoining wells).

3. Semi steady state, irregular flow boundary:

\[ P_{avg} - P_wf = \frac{141.2 \pi \varepsilon}{k h} \left( \ln \frac{1}{2} \frac{44 \pi}{\gamma G \varepsilon^2} + \varepsilon \right) \]

Applications: Irregular drainage shape, or asymmetrical positioning of well within drainage area.

Units and Nomenclature:

- \( A \): drainage area, square ft
- \( B \): formation volume factor
- \( C_s \): shape factor
- \( k \): permeability, md
- \( P_{avg} \): average reservoir pressure in drainage area, psi
- \( P_w \): pressure at outer drainage boundary, psi
The New IPIIMS Action Learning

Production Optimization

In this Learning Module, you will review the actual performance of Well 5A1-SW, as well as that of several other wells in offsetting fields, in an effort to optimize their production rates. By the time you complete this module, you should be able to analyze well behavior using nodal analysis and historical production trends, diagnose equipment problems and/or detect production deviations, and recommend the appropriate action for optimizing production.

Well 5A1-SW has been completed in the Upper/Middle sands, and a production and buildup test have been completed. You now need to see if the well's actual performance matches what was predicted before its completion. You will be looking for ways to optimize this well's production under both current and future reservoir conditions. You will also look at other wells, including two that are currently producing using electric submersible pumps and one that is planned as a rod pump completion, and make recommendations regarding their performance.

Updated module progress view

Subtopics in Production Optimization:

- Productivity Index and Flow Efficiency
- Stimulation Planning
- Well Performance Optimization, Part 1
- Well Performance Optimization, Part 2
- POST-ASSESSMENT

PRE-ASSESSMENT
Completed (Score: 84%)

ASSIGNMENT
Completed (Score: 100%)

ASSIGNMENT
Not Started

ASSIGNMENT
Not Started

ASSIGNMENT
Not Started

POST-ASSESSMENT
Not Started
Assignment Instruction

In this Learning Module, you will review the actual performance of Well 5A1-SW, as well as that of several other wells in offsetting fields, in an effort to optimize their production rates. By the time you complete this module, you should be able to analyze well behavior using nodal analysis and historical production trends, diagnose equipment problems and/or detect production deviations, and recommend the appropriate action for optimizing production.

Well 5A1-SW has been completed in the Upper/Middle sands, and a production and buildup tests have been completed. You now need to see if the well’s actual performance matches what was predicted before its completion. You will be looking for ways to optimize this well’s production under both current and future reservoir conditions. You will also look at other wells, including two that are currently producing using electric submersible pumps and one that is planned as a rod pump completion, and make recommendations regarding their performance.
The New IPIMS Action Learning: Assessment

**Assessment**

1. What type of acid do you recommend using for the main treatment?

   A. 28 percent hydrochloric acid
   
   B. Standard mixture of 12 percent hydrochloric (HCl) and 3 percent hydrofluoric (HF) acid
   
   C. Mixture of hydrochloric (HCl) and hydrofluoric (HF) acid, concentration to be determined by laboratory analysis of core material.
   
   D. Mixture of 15 percent HCl and 3 percent acetic acid

New assessment engine
Well Stimulation and Sand Control

Well stimulation treatments, which are designed to restore or enhance well productivity, are of two basic types. Matrix treatments are performed at pressures that are below the formation fracture pressure, they are primarily designed to remove near-wellbore damage. Fracture treatments, on the other hand, are performed at pressures above the formation fracture pressure, they are designed to open up highly conductive flow paths between the reservoir and the wellbore, thereby bypassing near-wellbore damage and changing the flow patterns around the well.

Sand control technology is built around preventing loose sand and other unconsolidated formation solids from plugging the formation or entering the wellbore. As you will see in this assignment, stimulation and sand control technologies are in some ways closely related, and under certain circumstances, may even overlap.

In this assignment, you will carry out preliminary design work both for a matrix acid stimulation and a hydraulic fracture treatment, and will also select the appropriate sand control measures for a flowing production well. In each case, you will evaluate the nature and extent of the near-wellbore damage that has made stimulation and/or sand control necessary.

Subtopics in Well Stimulation and Sand Control:

- PRE-ASSESSMENT
  - [Matrix Acid Stimulation](Score: 25%)
  - [Hydraulic Fracturing](Score: 50%)
- ASSIGNMENT
  - [Well Stimulation and Sand Control](In Progress)
- ASSIGNMENT
  - [Sand Control](Not Started)
- POST-ASSESSMENT
  - Not Started
Action Learning: Complete Entire Course

Initial Well Planning

Assignment Instructions

The Asset Management Team responsible for PETROS Corporation's portion of the Tremont onshore field has recently completed an appraisal of the 6th Zone reservoir, and is now preparing a development program. The team has given you a proposed bottomhole location for the first development well, Adams 6. The target location is in Block D-4, approximately 0.5 km (1640 ft) from the property boundary between PETROS Corporation and Apex Oil & Gas Company. The discovery well for the 6th Zone, the Adam's Copley 1, has additional wells (Copley 3, Adams 4, Adams 6 and Adams 7) have either failed or are currently producing commercial quantities of oil. Three others (Copley 2, Dussell 1 and Adams 5) were drilled outside of the structure boundaries and subsequently abandoned.

Your tasks in this assignment are to establish the drilling objectives for this well in keeping with the overall reservoir management strategy, and to identify some of the key issues to be addressed in the well planning process.

Subtopics in Initial Well Planning:

- Well Objectives
- Basic Well Planning Considerations
- Potential Hazards
- Regulatory Compliance
- Subsurface Pressure and Temperature Prediction

Estimated Topic Duration: 8h

Overall Topic Score: 95%

Course Status Details:

- Not Started
- Failed
- In Progress
- Completed
Action Learning: Detailed Score Results

Initial Well Planning

Detailed Status

Overall Status
Here is your progress status for Initial Well Planning. Your Certificate of Completion will be enabled once you complete all assignments and the post assessment with an average score of 75% or higher.

- FIRST ATTEMPT: 5/6/2013: 45%
- SECOND ATTEMPT: 3/5/2015: 100%
- Subsurface Pressures and Temperatures Prediction: 5/6/2013: 0%
- SECOND ATTEMPT: 3/5/2015: 100%
- POST-ASSESSMENT: 5/6/2013: 50%
- SECOND ATTEMPT: 3/5/2015: 100%

Overall Topic Score: 95%

Certificate of Completion
Rate This Course

Subsurface Pressure and Temperature Prediction

- Completed (Score: 100%)
- Failed (Score: 50%)
- Completed (Score: 100%)
- In Progress
- Completed (Score: 100%)
Action Learning: Certificate of Completion
Additional Examples
Regional Seal

A third play requirement is a regional seal which will confine the petroleum in the reservoir. The ideal regional seal has a fine grained, ductile lithology, with sufficient lateral distribution to cover the reservoir. The seal thus keeps the hydrocarbons in the carrier beds, and prevents them from leaking from the trap. One example of a good regional seal is slate or shale transgressing over gently dipping sedimentary reservoir on a continentate shelf. Another example is widespread evaporites varying shallow-marine carbonate rocks such as reefs (Figure 3).

Example of a Regional Seal

Enlarge and drag the image to see more.
Knowledge Checks: Interactive Examples

Drag & Drop and Fill In the Blank

Multiple Choice and Image Hotspot Identifier
Assessments: Interactive Examples

Matching Drag & Drop

Multiple Select