



Applicability of Rock Physics and Rock Mechanics in Shale Reservoirs

(July 9-13, 2018)

Venue: Indian Institute of Technology Roorkee, Roorkee-247667, Uttarakhand, India

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Overview

Rock Physics principles allow us to understand and interpret matrix and fluid related changes in porosity, pore space topology, and seismic and transport properties. This course introduces attendees to basic shale characteristics and explains how shale reservoirs differ from conventional reservoir lithologies. Using these differences, we then develop rock physics principles initially as empirical and descriptive methods. After establishing a sound understanding, we identify seismic and transport properties of shales using rockphysics, well logs, as well as empirical and theoretical models for better exploration and development of shale reservoirs. In the course, we will identify major shale rock properties and classify shales based on rock physics principles. We will show how the various pore systems in shales are different from conventional reservoir rocks and what effect such changes might have on seismic and flow properties due to pore size distributions changes. We will also demonstrate difference that fine-grained and organic components of shales can have on seismic and flow properties. With a basic understanding, the attendees will then assess various rock physics models that would allow building new models or alter existing ones for shales. A key aspect of this course will be to understand potential interpretation pitfalls in using standard rockphysics models in shales.

Objective:

The main objective for this course is to impart knowledge about identifying seismic and transport properties in unconventional shale reservoirs. Specifically, the course attendees will learn how to:

1. Identify and list changes in rock properties in mud rocks; classify mud rocks and the potential changes due to kerogen presence, amount, and maturity
2. Identify various pore systems in mud rocks; recognize types of pore size distribution data; assess changes in porosity and pore size distributions due to organics; assess changes in flow properties due to pore size distributions
3. Classify velocity and resistivity correlations in mud rocks based on porosity / maturity / pore size changes / mineralogy; create velocity - porosity correlations in mud rocks; assess variations from conventional rocks
4. Apply basic rock physics models (empirical and theoretical) to mudrocks and predict potential changes due to organic content and its maturity; distinguish between changes in velocity - porosity relations in conventional and in organics-rich systems
5. Identify pitfalls in using standard rockphysics models in mudrocks
8. Select and evaluate example data with various RP models to select best model to describe the changes
9. Create an experimental program to acquire appropriate data for evaluation

Course Information	Duration: July 9-13, 2018
Modules	<p>Module 1: Introduction and Definition: Why and what exactly is unconventional? Module 2: Porosity characterization in organic and inorganic shales Module 3: Velocity and resistivity behaviors of unconventional resources Module 4: Theoretical model for effective medium modeling Module 5: Field applications</p> <p>Number of participants for the course will be limited to fifty.</p>
You Should Attend If...	<ul style="list-style-type: none"> ▪ Geologists, geophysicists, engineers, & researchers from all private and public enterprises with an interest in subsurface characterization of unconventional resources. ▪ Student at all levels (BSc/BTech/MSc/MTech/PhD) and faculty from academic and technical institutions
Fees	<p>The participation fees for attending the course is as follows:</p> <ul style="list-style-type: none"> • Participants from abroad: US \$500 • Industry/ Research Organizations: Rs. 12000.00 • Academic Institutions (Faculty): Rs. 7000.00 • Academic Institutions (Students): Rs. 3000.00 <p>➤ Students have to show the proof of their full time student enrollment in academic institute.</p> <p>The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, free internet facility.</p> <p>Fee does not include accommodation and food. On request basis, participants may be provided with accommodation on payment basis.</p> <p>Note: Accommodation: 1. The registration fee should be sent in advance through bank draft drawn in favor of "Dean SRIC, IIT Roorkee" and payable at Roorkee latest by June 25, 2018. 2. The Complete form along with payment may please be sent to: Dr. Ravi Sharma, Department of Sciences, IIT Roorkee, Roorkee-247667, Uttarakhand e-mail: ravisharmafes@iitr.ac.in, ravisharmafes@gmail.com</p>

The Faculty



Prof. Manika Prasad is a Professor of Petroleum Engineering at Colorado School of Mines (CSM), Golden, USA. She received her BS from Bombay University and went on to earn her MS and doctorate from Kiel University in Germany. Before joining CSM, she was associated with various reputed research labs (Stanford University, University of Hawaii, etc.) and worked in various capacities. She is the recipient of prestigious Virgil Kaufman gold medal at SEG 2017 in addition to many others. She is perhaps a handful of researchers who have been selected by multiple societies (SPE, SEG, AAPG) for their distinguished lecture tours. Fondly known as the mud queen among her peers and students, she pioneered the intergral research in source rich rock and fluid properties using tools and techniques from geoscience and engineering domains. Contact email id: mprasad@mines.edu



Dr. Ravi Sharma received the first Masters' (M.Tech.) in Applied Geophysics from the University of Roorkee in the year 1999. He received his second Masters' and a PhD in Petroleum Engineering from Colorado School of Mines, Golden, USA in the year 2015. Dr. Sharma has a rich industry experience right from his days with ONGC from 2001 to 2007 and with other multinational oil and gas companies such as BP, MOC and COP from 2008 to 2015. He mostly worked in multidisciplinary teams performing validation and integration of geoscience data for predicting of rock and fluid properties using seismic/acoustic amplitudes acquired through experiments in laboratories and in fields. He has extensive research experience with experimentation and modelling for storage, flow and elastic property prediction in the reservoirs using Petrophysical and Rock Physics techniques and tools. His other interests include Flow Through Porous Media, Simulation, Hydraulic Fracturing, Unconventional Resources, Digital Rock Physics, Attenuation and Dispersion in seismic rock properties. He received many merit awards for his professional services and research activities and been the recipient of prestigious scholarships. He serves on the review and editorial board of reputed geoscience journals. He currently serves as Assistant Professor at the Department of Earth Sciences in IIT Roorkee. Contact email ID: ravisharmafes@iitr.ac.in

Course Co-ordinator

Dr. Ravi Sharma

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For registration visit:
<http://www.gian.iitkgp.ac.in/GREGN>

Indian Institute of Technology Roorkee

Registration Form

Applicability of Rock Physics and Rock Mechanics in Shale Reservoirs

(MHRD Scheme on Global Initiative on Academic Network (GIAN))

July 9-13, 2018

- Name
- Designation
- Affiliation
- Address for Correspondence
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- Email:
- Phone No:
- Accommodation required: **Yes / No**
- Type: Hotel/Hostel/Guest House (accommodation shared basis may be available @Rs. 500/ per day)
- Cheque/DD No.
- Dated for Rs.

Date

Signature of the participant

Note:

1. The registration fee should be sent in advance through bank draft drawn in favor of "Dean SRIC, IIT Roorkee" and payable at Roorkee latest by June 25, 2018.

2. The Complete form along with payment may please be sent to:

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