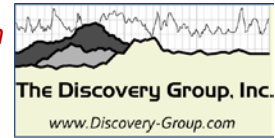


## Speed Dating with Cores: A petrophysical approach to core description

Daniel A. Krygowski, Senior Petrophysical Advisor, The Discovery Group  
(Other instructors may also be available for the course.)



*The Discovery Group offers courses in petrophysics for your people, at your location, at a date convenient to your needs and internal schedules. The courses will benefit geologists, engineers, geophysicists, and geotechs, and can be of benefit to other specialists who routinely work with those geotechnical specialists. The best class size is from about 10 to 25 people from a variety of specialties who can share their professional experiences in the context of a greater understanding of petrophysics.*

**Synopsis:** This course is focused on quickly and accurately producing a fit-for-purpose petrophysical core description, particularly if your time or access to the core is limited. Learn how to assess a core, determine its condition, and depth shift it into alignment with logs, and how to best sample the core if you are only allowed a limited number of samples; e.g., sampling a partner or public core. Cores used in the course are those that are available to your company. Ideally, several cores will be available so that participants will be exposed to several lithologies and depositional environments, and have enough physical space around the core to easily observe it.

### *The course:*

- Quickly reviews basic lithologic models in siliciclastics (e.g., Folk and others), carbonates (e.g., Lucia and others), and with the addition of significant amounts of organic matter.
- Considers how to quickly assess the condition of the core; the order of the pieces, sections that are missing, etc.
- Provides a methodology to quickly describe a core with respect to existing well log data without spending too much time on features which are too small to be sensed by the logs;
- Provides the means to depth shift the core to log depths, and to determine how the shift might change over the length of the core;
- Explores different sampling methodologies and how the precision desired from the core measurement is related to the number of samples taken;
- Introduces the Digital Rock Classification system (DRC), a descriptive methodology for cores that can be more easily used with other digital well data for interpretation.

### *Course topics include:*

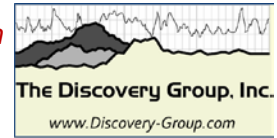
- A brief review of lithologic models;
- Describing a core from a petrophysical viewpoint; that is, quickly determining features of the core that can be seen on available logs;
- Identifying units in the core with consistent features and tying those features to a digital (numeric) description;
- Comparing the descriptive notes of individuals to assess the consistency and level of observations of a group of people.

**Length:** one day

**Equipment needed:** Calculator, ruler. Core description forms (hardcopy and/or Excel-based) will be provided.

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**Agenda:** The times shown are best estimates based on previous presentations of the course. The times will vary to some extent, depending on the questions and comments of the class. Questions and comments based on the experience of the class participants are welcome, and often provide insights to local conditions and methods which would not otherwise be presented.

While formal breaks are often taken, as dictated by class needs.

### Day 1

Course logistics and Introduction

Review of lithologic systems and descriptions

Introduction to the Digital Rock Classification (DRC) system

Description of the first core

Ideally there will be several cores available for description at the same time so that the class can be divided among the cores.

Discussion of the core description methodology

Discussion of the positive aspects and problems encountered in the methodology is more important than discussion of the core itself.

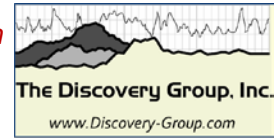
Description of the second core

Description of other cores

Discussion of the results of all the cores; specific to the core descriptions themselves.

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### About the instructor:



**Daniel A. Krygowski** is a Senior Petrophysical Advisor with The Discovery Group, which he joined in late 2006. He has over 35 years of experience in the art and science of petrophysics, and in the development and design of petrophysical software. Dan earned a B.A. in Physics from the State University of New York at Geneseo. After earning M.S. and Ph.D. degrees in geophysics from the Colorado School of Mines (with a focus on petrophysics), he joined Cities Service Company, and worked in Denver and Tulsa. After Citco, he joined Atlantic Richfield Company (ARCO). In both companies, he gained experience in a variety of geologic and geographic areas in both technical and management positions in petrophysics.

After ARCO, he joined Landmark Graphics, and was a member of the PetroWorks development team as the team's petrophysical Subject Matter Expert. He was also involved in interface design, and development of documentation and training materials. When Landmark closed its Austin, Texas office, Dan joined Chevron, working in deep Gulf of Mexico and Chad, Africa projects. He also supported internal petrophysical training efforts.

Since the late Cretaceous, Dan has taught the AAPG *Basic Well Log Analysis* course annually with Dr. George Asquith of Texas Tech University, and for the last several years, with the addition of Rick Lewis, of Schlumberger. Dan also teaches *Basic Openhole Log Interpretation*, a similar, but shorter course, and *Petrophysics Elements*, a much longer, lower intensity course meant to delve deeper into petrophysical information and methods as part of participants' regular job duties. Both are taught through direct client requests. Dan and other Discovery Group members present other petrophysical courses as well.

In 2004, AAPG published George and Dan's book, *Basic Well Log Analysis*, a second edition of George's 1983 similarly-named book which was one of the AAPG's all-time best-selling publications. The 2004 edition has also become an AAPG best-seller.

Dan is a member of the Society of Petrophysicists and Well Log Analysts (SPWLA), American Association of Petroleum Geologists (AAPG), Society of Petroleum Engineers (SPE), Society of Exploration Geophysicists (SEG), the Denver Well Logging Society (DWLS), and the Rocky Mountain Association of Geologists (RMAG).

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