Applied Biostratigraphy and Sequence Stratigraphy in Oil Exploration and Development Training Course

Professional Development Training Course Outline

Category	Oil and Gas	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In the highly competitive and risk-intensive upstream oil and gas sector, **precise subsurface characterization** is paramount for successful exploration and development. This course offers a comprehensive, **applied training** program focused on the synergistic integration of **biostratigraphy** and **sequence stratigraphy**. Biostratigraphy, the science of using fossils to date and correlate rock strata, provides the high-resolution temporal framework essential for geological modeling. Sequence stratigraphy, which analyzes rock units based on genetically related depositional systems, offers a powerful framework for predicting the distribution of **hydrocarbon plays** and **reservoir facies**. By combining these two **geological disciplines**, professionals can build robust, predictive models that significantly reduce exploration risk and optimize field development.

Applied Biostratigraphy and Sequence Stratigraphy in Oil Exploration and Development Training Course is designed to equip geoscientists and engineers with the practical skills needed to interpret and apply these techniques. Participants will learn how to leverage **microfossil data** to identify **key stratigraphic surfaces**, understand **depositional environments**, and correlate wells with unparalleled accuracy. The course goes beyond theoretical concepts, focusing on **real-world applications** and **integrated workflows** that are critical for modern **petroleum exploration**. This is not just a course on geology; it's a program on how to use advanced geological tools to make smarter, more profitable decisions in the oil and gas industry.

Programme Curriculum

Applied Biostratigraphy and Sequence Stratigraphy in Oil Exploration and Development Training Course

Introduction

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Course Duration

5 days

Course Objectives

Upon completion of this course, participants will be able to:

- Integrate biostratigraphic and sequence stratigraphic data for enhanced subsurface reservoir characterization.
- Identify and utilize key index fossils and fossil assemblages for accurate chronostratigraphic correlation.
- Recognize and interpret major stratigraphic surfaces and systems tracts on well logs and seismic data.
- Apply biostratigraphic data to reconstruct paleoenvironments and predict depositional facies.
- Optimize the use of biostratigraphic data to define hydrocarbon plays and reduce exploration risk.
- Construct high-resolution sequence stratigraphic frameworks in various sedimentary basins.
- Delineate reservoir and seal intervals with greater precision for field development planning.
- Interpret complex stratigraphic successions by identifying unconformities and hiatuses.
- Utilize biostratigraphy as a predictive tool in frontier and mature basins.
- Evaluate the quality and limitations of biostratigraphic data to avoid common pitfalls.
- Correlate wells effectively using both microfossil and wireline log data.
- Generate and interpret biozonation charts and stratigraphic range charts.
- Improve overall geological interpretation skills for a multi-disciplinary team environment.

Organizational Benefits

- Providing geoscientists with the skills to more accurately predict the presence and distribution of **hydrocarbon reservoirs**, leading to higher drilling success rates and more efficient **field development**.
- Enabling the creation of more precise and robust geological models through the integration of **high-resolution stratigraphic data**, which is crucial for maximizing resource recovery.
- Equipping multi-disciplinary teams (geologists, geophysicists, reservoir engineers) with a shared understanding and common language for **stratigraphic analysis**, fostering better collaboration and decision-making.
- Minimizing the need for costly external consulting services by building in-house expertise in these critical disciplines.

- Providing the tools to re-evaluate existing assets and identify overlooked **stratigraphic traps** or bypassed pay zones in mature fields.

Target Audience

- Exploration Geologists
- Development Geologists
- Reservoir Geologists
- Geophysicists and Seismic Interpreters
- Petroleum Engineers
- Subsurface Team Leads and Managers
- Sedimentologists and Stratigraphers
- Consultants and Technical Specialists working on oil and gas projects

Course Modules

Module 1: Foundations of Biostratigraphy

- Introduction to the principles of **Biostratigraphy** and **Chronostratigraphy**.
- Overview of major **microfossil groups** (Foraminifera, Nannofossils, Palynomorphs) and their applications.
- Understanding **biozones**, **index fossils**, and the concept of **first and last downhole occurrences**.
- Hands-on exercises in preparing and interpreting **biostratigraphic charts**.
- **Case Study:** The use of Foraminifera biozones to date and correlate Eocene-Oligocene sequences in the Gulf of Mexico.

Module 2: Applied Sequence Stratigraphy Concepts

- Principles of **Sequence Stratigraphy**: defining **sequences**, **systems tracts**, and key bounding surfaces.
- Controls on basin fill: **eustasy**, **tectonics**, and **sediment supply**.
- Identifying **Sequence Boundaries**, **Maximum Flooding Surfaces (MFS)**, and **Transgressive Surfaces of Erosion**.
- Interpreting **parasequence sets** and **stacking patterns** from well logs.
- **Case Study:** Analyzing sequence stratigraphic frameworks in a passive margin basin (e.g., West Africa) to predict reservoir distribution.

Module 3: Integration of Biostratigraphy and Sequence Stratigraphy

- The synergistic power of **integrated stratigraphic analysis**.
- Using biostratigraphic data to calibrate and **validate seismic interpretations**.
- Identifying key surfaces (**SB, MFS**) and **condensed sections** with microfossil assemblages.
- Creating a high-resolution, integrated **geological framework** for exploration.
- **Case Study:** Using a combined biostratigraphic and sequence stratigraphic approach to de-risk an offshore exploration prospect by identifying prospective turbidite fans.

Module 4: Paleoenvironmental Analysis & Facies Prediction

- Utilizing **biofacies analysis** to interpret **depositional environments**
- Using microfossil assemblages to determine **paleobathymetry** and water depth changes.
- Predicting reservoir and seal **facies distribution** across a basin.
- Identifying **source rock potential** using organic-walled microfossils (Palynology).

- **Case Study:** Reconstructing the paleoenvironmental evolution of a deltaic system in the Niger Delta using an integrated biostratigraphic and sedimentological approach.

Module 5: Stratigraphic Traps and Hydrocarbon Play Definition

- Defining and identifying **stratigraphic traps**
- Using **sequence stratigraphy** to predict the location of potential stratigraphic traps.
- Applying biostratigraphic data to mature basins to identify bypassed **stratigraphic plays**.
- Risking new exploration prospects based on a robust **stratigraphic framework**.
- **Case Study:** Characterizing a series of deepwater turbidite channels in the Brazilian Santos Basin using sequence stratigraphy and well data to identify a major hydrocarbon discovery.

Module 6: Well Correlation and Subsurface Mapping

- Principles of **well correlation** using biostratigraphic markers and well logs.
- Building regional and field-scale **correlation panels**.
- Creating **isochron maps** and **paleogeographic reconstructions**.
- Overcoming challenges in correlation, such as **faulting** and **complex stratigraphy**.
- **Case Study:** Correlating wells across a complex faulted terrain in the North Sea using biostratigraphy to resolve stratigraphic relationships.

Module 7: Applied Seismic Stratigraphy

- Fundamental principles of **seismic stratigraphy**.
- Identifying **seismic facies** and **stratal stacking patterns** on seismic data.
- Using seismic data to identify **unconformities**, **onlaps**, and **prograding clinoforms**.
- Integrating **biostratigraphic data** to calibrate and interpret seismic lines.
- **Case Study:** Using integrated seismic and biostratigraphic data to define a hydrocarbon play in a challenging seismic area of the Venezuelan Llanos Basin.

Module 8: Advanced Applications & New Technologies

- Advanced **Quantitative Biostratigraphy** and numerical methods.
- The role of **Artificial Intelligence (AI)** and **Machine Learning** in stratigraphic analysis.
- Integrating biostratigraphic data with **geochemical** and **petrophysical** datasets.
- Applications in **unconventional plays** and **geosteering**.
- **Case Study:** How machine learning is being used to automate microfossil identification and accelerate the generation of biostratigraphic charts.

Training Methodology

Our training methodology combines **interactive learning** with **practical, hands-on exercises** to ensure deep understanding and skill retention. The course will be delivered through a mix of:

- Lectures and Presentations
- Group Discussions: Fostering peer-to-peer learning and problem-solving.
- Practical Exercises.
- Case Studies: In-depth analysis of successful projects from various global basins.
- Question-and-Answer Sessions.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

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