



## Discipline Information

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The following dates are in (dd/mm/yyyy) format.

Code: GSA5874 - 1 Type: POS  
Name: Seismic Interpretation of sedimentary basins  
Concentration area: Geotectônica (44141)

Approval dates:

CCP: 03/08/2015 CPG: 04/08/2015 CoPGr:

Activation date: 04/08/2015 Inactivation date:

Workload:

Total: 60 h Theory: 5 h Practice: 3 h Study: 2 h

Credits: 4 Duration: 6 weeks

1131008 - Liliane Janikian Paes de Almeida - 04/08/2015 until today

Professors: 2052941 - Renato Paes de Almeida - 04/08/2015 until today

2245960 - Andre Oliveira Sawakuchi - 04/08/2015 until today

Objectives:

The main objective is familiarizing graduate students with models and techniques for the interpretation of seismic sections focusing on hydrocarbon exploration. Discussed subjects include acquisition and processing methods, physical properties of sedimentary rocks, structural interpretation of seismograms, seismic facies and depositional systems, stratigraphic significance of seismic reflectors, stratal patterns terminations, and advanced aspects of sequence stratigraphy and applications of seismic stratigraphy to petroleum geology and basin analysis.

Rationale:

Interpretation of seismic sections is the main tool in hydrocarbon exploration and in the reconstruction of the large-scale stratigraphic evolution of sedimentary basins. Additionally the conceptual basis for the stratigraphic interpretation of seismic sections resulted in one of the major areas of modern day sedimentary geology: sequence stratigraphy. The proposed course aims at contributing for the formation of graduate students, exposing the basic tools and concepts for the understanding of tectonic and sedimentary processes responsible for the evolution of sedimentary basins, with implications for the origin, migration and accumulation of hydrocarbons.

Content:

Introduction- Introduction to seismic reflection surveys; method history; waves in solid bodies; physical principles of seismic stratigraphy; method applications; acquisition and interpretation of seismic reflection data. Principles of reflection seismic interpretation – Rock physical properties; resolution in seismic sections, vertical and horizontal, stratigraphic significance of seismic sections; chronological significance of seismic reflectors; identification and interpretation of tectonic structures on seismic sections, structural styles; stratigraphic implications of tectonic features. Stratigraphic interpretation: depositional systems – Seismic facies and depositional systems 1: clastic systems; architectural elements and seismic facies in 2D and 3D; Seismic facies and depositional systems 2: carbonate systems; main attributes of carbonate rocks; classification and recognition of carbonate platforms in seismic sections. Sequence Stratigraphy – Chronologically meaningful surfaces and reflector termination patterns; principles of sequence stratigraphy: a model for large scale depositional geometries; accommodation and sedimentary input; depositional system tracts and bounding surfaces; chrono-stratigraphic charts in the analysis of seismic sections; external controls on deposition and their expression in seismic sections: eustasy and sea-level curves, climate tectonics and sediment production; local and regional tectonics, subsidence patterns. Seismic stratigraphy in hydrocarbon exploration- applications for petroleum geology; integration with well log data; characterization of petroleum systems; direct detection of hydrocarbons and attribute sections; sequence stratigraphy and seismic stratigraphy of the Brazilian continental margin: geologic evolution, sedimentation cycles, tectonic

evolution, origin, migration and accumulation of hydrocarbons.

#### Bibliography:

ABREU, V., NEAL, J. E., BOHACS, K. M., KALBAS, J. L. 2010. Sequence Stratigraphy of Siliciclastic Systems – The ExxonMobil Methodology. SEPM Concepts in Sedimentology and Paleontology #9. 226 p. BALLY, A. W. 1983. Seismic expression of structural styles - a picture and work atlas. Tulsa, American Association of Petroleum Geologists, Studies in Geology #15, 3v. BALLY, A. W. 1988. Atlas of seismic stratigraphy. Tulsa, American Association of Petroleum Geologists, Studies in Geology #27, 2v. CATUNEANU, O. 2006. Principles of Sequence Stratigraphy. Elsevier, 375 p.

#### Type of Assessment:

Tests and seminars

