Course Type	Course Code	Name of Course	L	T	P	Credit
DE	NGPD502	**Well Log and Electrofacies Analysis**	3	0	0	3

Course Objective

- Importance of quality control, visualization in interpreting petrophysical parameters like porosity, permeability, and saturation.
- Knowledge on production logging as well as geothermal reservoir characterizing with wireline logging measurement.
- Understanding subsurface in-situ stress components and pore pressure mechanism and their estimation techniques. Define rock facies from different combination of well logs with machine learning approach.

Learning Outcomes

- The primary objective of the course is to understand, usability and interpretation of wireline logs for subsurface energy, and energy transition.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Quality control of wireline logs;	**2**	Identification of bad quality log data and mitigation plan
2	Wireline data loading, visualization, and plotting with python, basic petrophysical properties	**2**	Role of data visualization and plotting technique for evaluation and interpretation
3	Production logging tools and their application	**5**	Understanding about cased hole logging
4	Pore pressure mechanism and estimation techniques with wireline logs, seismic velocity	**4**	Prediction of pore pressure profile with depth for safer drilling plan
5	Importance of cross-plotting technique and its usability in resource characterization	**2**	Interpretation technique with cross plot method
6	In situ stress components, estimation technique, and wellbore stability concept	**5**	Deformation characteristic of rocks
7	Interpretation of well log data for evaluation of carbonate formation	**3**	Well log interpretation for carbonate reservoir
8	Facies concept and importance in hydrocarbon and mineral exploration	**3**	Electrofacies and lithofacies concept
9	Electrofacies analysis from wireline logs	**3**	Facies analysis
10	Different statistical techniques for facies identification – clustering, PCA	**4**	Facies prediction and interpretation
11	Basic wireline logs used for CBM exploration and development	**4**	Usefulness of well log for CBM
12	Importance of wireline logs in Geothermal field development and characterization	**5**	Geothermal characterization
	Total	**42**	

Textbooks

1. Bateman, R, M., 1985, SPE, Open Hole Log Analysis and Formation Evaluation
2. Bateman, R. M., 1985, Springer, Cased Hole Log Analysis and Reservoir Performances monitoring.

Reference Books

1. Asquith, G. and Krygowski, D., 2004, AAPG, Basic Well Log Analysis