An Introduction to Numerical Modeling & Simulation in Oil & Gas Industry

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Course Summary

Advances in exploration and production of oil & gas has required better use of multi-disciplinary engineering, analytical and numerical modeling. The emphasis to reduce uncertainty in finding oil & gas, failures, costs and most importantly improve safety has driven the industry to adopt and depend on numerical modeling and simulations. This short course will provide an overview of the basics of oil & gas exploration, drilling and completions (upstream) and illustrate how numerical modeling and simulations are used. The course will also provide an overview of the major numerical modeling methods and practices used in the upstream side of oil & gas industry.

Course Description

Lecture	Course Content		Time (mins)
1	I.	Introduction to Oil & Gas	30
	II.	Major disciplines and its functions	30
	III.	Oil & Gas exploration – Modeling practices	60
2	I.	Well Construction practices	120
		a. Drilling a well	
		b. Well Planning through modeling	
		c. Real Time modeling needs during drilling	
		d. Post drilling analysis	
3	II.	Well Construction practices	120
		a. Completions	
		b. Ensuring best practices in completing a drilled well	
		c. Perforating and Hydraulic Fracturing	
4	III.	Production practices	75
		a. Production monitoring	
		b. Artificial lift	
		c. Production optimization	
	IV.	Decommissioning/ Abandonment	15
	V.	Brief introduction to Midstream and Downstream modeling practices	15
	VI.	Question & Answers	15