

20PEB306P					Introduction to Petroleum Software					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
0	0	2	1	2	-	-	-	50	50	100

**COURSE OBJECTIVES**

- To provide an overview of software tools used in the oil and gas industry
- To provide the importance of modelling and simulations for different petroleum engineering problems
- To explain how to identify the best tool matching the type and scope of the numerical study

**List of Experiments:****Week 1 and Week 2: Kingdom Suite: Seismic and Geological Interpretation Software**

Optimize Interpretations, Drilling decisions and field development

**Week 3: Petrel: Geophysics, Geology and Modelling**

Prestack processing, Microseismic, Reservoir Elastic Modelling, 1D Petroleum System Modelling

**Week 4: Petrel-RE**

Production Forecasting, Reservoir and Dual Scale Modelling

**Week 5: RISC/CRYSTAL BALL**

Reserve Estimation

**Week 6: Interactive Petrophysics**

Petro physical and Multi-well interpretation

**Week 7 and Week 8: Saphir (KAAPA)**

Pressure Transient Analysis and Production Behaviour

**Week 9 and Week 10: WELLCAT (Landmark) and WELL FLO**

Casing Design, Drill string design, Production Design, Tube Design, Production Optimization, Nodal Analysis

**Week 11: GOHFER**

Geomechanics Fracture Simulator, Hydraulic Fracturing: Design, Analysis and Optimization

**Week 12: HTRI**

Heat Exchanger Design and Simulation, Design of industrial-scale heat transfer equipment

**Week 13: CHEMCAD/ASPEN/HYSYS**

Chemical Process Simulation, Project/Process Design and Optimization

**COURSE OUTCOMES**

On completion of the course, student will be able to

CO1: Demonstrate the role of simulation software in the engineering industry and in specific to the upstream petroleum industry

CO2: Classify the various software tools available in the individual domain of upstream petroleum industry like seismic data processing and interpretation, reservoir modelling and simulation, drilling and production engineering.

CO3: Build a reservoir simulation model using CMG (reservoir simulation software) and simulate the specific initial and boundary constraints defined.

CO4: Excel the fundamental modelling workflows associated with the simulation software like conceptualizing, mathematical modelling, numerical modelling and solving the set of equations using the gauss elimination technique.

CO5: Comprehend complex and dynamic nature of the petroleum engineering problems and formulate a solution strategy for effective management at the field scale.

CO6: Identify the best tool matching the type and scope of the numerical study the student has been deployed to perform in the future.

**END SEMESTER EXAMINATION QUESTION PAPER PATTERN**

**Max. Marks: 100**

**PART A:** Evaluation Based on the class performance and Laboratory book

**PART B:** Viva Examination based conducted experiments

**Exam Duration: 3 Hrs**

**50 Marks**

**50 Marks**