

Exploring Engineering And Petroleum Technology										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
5	-	-	-	5	-	-	-	-	-	-
<p>Unit 1: Hours : 4 Hydrocarbon Industry and its linkages to climate and geopolitics, Global energy outlook</p> <p>Unit 2: Hours : 4 Entire value chain of the Hydrocarbon Industry. Significance of different disciplines and its usefulness in various stages of value chain.</p> <p style="text-align: right;">Total Hrs - 8</p>										
<p>Texts and References:</p> <ol style="list-style-type: none"> Conaway, C. F. The Petroleum Industry: non-technical guide. 										

Earth Science and Sedimentary Geology

Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
5	-	-	-	5	-	-	-	-	-	-
Unit 1:										8
Introduction to Earth System, Rock Cycle, Igneous, Sedimentary and Metamorphic rocks.										
Unit 2:										12
Introduction to Sedimentary geology, genesis of sediment (Clastic and non-clastic), Classification and characteristic of Clastic rocks, Non-clastic and evaporate rocks as reservoirs.										
										Total Hrs - 20
Texts and References:										
1. Parbin Singh. A "Text book of Engineering and General Geology", Katson publishing house, Ludhiana 2009										
2. Sengupta, S" Introduction to sedimentology, Taylor & Francis, 01-Jan-1994										

Fundamentals of Drilling Engineering

Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
5	-	-	-	5	-	-	-	-	-	-

Unit-1: Drilling Rig Components:

Hours: 05

Drilling Rig: Components, Selection and Operating systems - Hoisting, Circulation and Rotary systems, Power transmission, Rig control system. Wire lines and service life evaluation. Pore Pressure prediction, Fracture pressure, abnormal pressure. Well Planning, GeoTechnical Order (GTO)

Unit II : Drilling Fluid

Hours:05

Drilling Fluids – Basics, Functions, Classification, Properties and Nature. Drilling fluids equipment related to pressure and separation. Formulations of drilling fluid, Mud systems like Pneumatic, Synthetic oil based, Inhibitive and Non-inhibitive Rheology models of drilling fluids Mud Hydraulics and Mud weight and Pressure loss calculations in round trip circulation cycle. Balanced/Underbalanced drilling.

Unit III : Drill String, Casing string, drill bits and Wellhead Equipment

Hours : 05

Configuration, Operations, Properties

Unit IV: Cementing

Hours : 05

Cementing, Cements & cement slurry: Objectives of cementing, oil well cements, Classification of cement, Slurry design, Slurry additives, Factors influencing cement slurry design, Cementing equipments. Cementing Methods: Primary cementing, Stage cementing, Liner cementing, Plugging, Squeeze Cementing techniques in practice. Deep well cementing, Characteristics of good quality cementation.

Total Hrs -20

Texts and References:

1. Malcom Rider, Second Edition, 2002: The Geological Interpretation of well logs, Rider-French Consulting limited
2. Oeberto Serra & Lorenzo Serra, 2004 : Well logging - data acquisition and applications, Edition Serralog, France
3. Jordan J R and Campbell F. L., , SPE, New York, 1986: Well Logging Vol. 1 and 2
4. Ellis, D. V. and Singer, J. M. 2nd edition, 2007: Well logging for Earth Scientist, Springer
5. Toby Darling, Well logging and Formation Evaluation, Gulf Professional Publishing, Elsevier Science

FUNDAMENTALS OF PRODUCTION ENGINEERING

Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
5	-	-	-	5	-	-	-	-	-	-
<p>Unit 1:</p> <p>Introduction - Description of - typical oilfield., Producing field functional activities ; Role and activities as an production engineer ; Fluid flow through rocks, Petroleum Production system; Components of a producing oil well; Well performance – Inflow and outflow performance and choke performance.</p>					Hrs -10					
<p>Unit 2:</p> <p>Well Perforation – Perforation fundamentals, Underbalanced and overbalanced perforation</p>					Hrs -3					
<p>Unit 3:</p> <p>Well Completion – Fundamentals of well completion, Concept of single, dual and multiple well completion, (2 hours)</p> <p>Well Testing and Activation - Periodic and Conventional Well Testing, Well activation technique.</p>					Hrs -4					
<p>Unit 4 :</p> <p>Introduction to Artificial lift techniques</p>					Hrs -3					
Total Hrs -20										

Petroleum reservoir fluids and rock properties

Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
5	-	-	-	5	-	-	-	-	-	-

Unit 1:

Hours : 5

Reservoir fluid Composition, Thermodynamic behavior of hydrocarbon system both gas and liquid, vapour liquid equilibria, PVT analysis, evaluation and correlation of physical properties of petroleum reservoir fluids including laboratory and empirical methods.

Unit 2:

Hours : 5

Introduction to reservoir media –porous and fracture medium, concept of porosity and permeability, Darcy’s law, concepts of fluid saturation, wettability, capillary pressure and relative permeability for understanding multiphase flow behavior in reservoir system, Electrical properties of reservoir rocks.

Unit 3:

Hours :5

Fundamental concepts and mathematical expressions of relative permeability, Salient features of Gas-Oil and Water-Oil relative permeability Curves, Factors affecting relative permeability, Three phase relative permeability, Laboratory measurement of relative permeability

Unit 4:

Hours : 5

Fundamentals of flow in porous media, Classification of flow system in porous media, Single phase and multiphase fluid flow in different state (steady and unsteady) and different system (linear, radial) considering compressible, slightly compressible and incompressible fluid.

Total Hours : 20

Recommended Books

1. Petroleum Reservoir Rock and Fluid Properties – Abhijit Y. Dandekar- Taylor and Francis-2006
2. Fundamentals Principles of Reservoir Engineering – Brian F. Towler – SPE textbook series, Volume 8 – 2002.
3. Fundamentals of Reservoir Engineering – L. P. Dake – Elsevier, 17th Edition, 1998