

Gas Processing & Transmission

CHE -444	Subject: Gas Processing & Transmission Processing &	2CH	
		Theory (2)	
Pre-req.	Nil	Category	Elective
Course Contents			
Basic Concepts: Introduction to natural gas industry, gas production, testing of well fluid; Test separator, Multiphase flow meters, establishing GOR. Gas Sweetening Process: Chemical and Physical solvent processes. Membrane/molecular sieve processes, Cryogenic separation, solvent regeneration. Dehydration of Natural Gas, LPG recovery and condensate stabilization, LNG and CNG. Gas processing facilities, process flow schemes and product specifications. Processing facilities: Gas processing facilities, process flow schemes and product specifications. Gas compression and Equipment's: Gas compression; compressor types, selection between centrifugal and reciprocating compressor, design considerations. Energy conservation in gas processing facilities. Pigging gas lines Separation process: Gas-liquid separation design and configurations Gas Emissions: Disposal of gas field emissions, effluent, produced water (EOR, Re-injection, flaring) Design, metallurgy and corrosion protection of gas pipelines and equipment. Sludge handling. Flare System: Flare system design; PSVs, blow down, flare/vent stack sizing. Case Studies: Simulation process of Sweetening process			
system loads: Estimation of design loads, sizing of services & stub mains, modification of existing systems, design of a new distribution system. Types of distribution system. Flow calculations & sizing of mains using practical flow equations. Distribution pressures. Types of distribution network. Network diagram and its related concepts & principles. Gas metering. Pressure regulators: domestic, commercial & industrial.			

Week /Lecture	Topic
1-2	Basic Concepts: Introduction to natural gas industry, gas production, testing of well fluid; Test separator, Multiphase flow meters, establishing GOR.
3-4	Gas Sweetening Process: Chemical and Physical solvent processes. Membrane/molecular sieve processes, Cryogenic separation, solvent regeneration. Dehydration of Natural Gas, LPG recovery and condensate stabilization, LNG and CNG. Gas processing facilities, process flow schemes and product specifications.
5-6	Processing facilities: Gas processing facilities, process flow schemes and product specifications.
7-8	Gas compression and Equipment's: Gas compression; compressor types, selection between centrifugal and reciprocating compressor, design considerations. Energy conservation in gas processing facilities. Pigging of gas lines
9	MID TERM EXAM
10-11	Separation process: Gas-liquid separation design and configurations
12-13	Gas Emissions: Disposal of gas field emissions, effluent, produced water (EOR, Re-injection, flaring) Design, metallurgy and corrosion protection of gas pipelines and equipment. Sludge handling.
14	Flare System: Flare system design; PSVs, blow down, flare/vent stack sizing.
15-16	Case Studies: Simulation process of Sweetening process
17	Revision
18	End Semester Exam
TEXT AND REFERENCE BOOKS: • Ken Arnold, Maurice Stewart, Design of Gas Handling Systems and Facilities, Volume 2, Gulf Publishing Company,1989 • Stephen A. Newman, Acid and Sour Gas Treating Processes, Gulf Publishing Company,1985. • Donald L. Katz, Handbook of Natural Gas Engineering, McGraw-Hill,1990. • M. Saeed, Handbook of Natural Gas Transmission and Processing, Gulf Publishing Company,2006. • E. J. Hoffman, Membrane Separation Technology, Gulf Publishing Company,2003. • Tarek Ahmed. "Reservoir Engineering Handbook", Gulf Professional Publishing,4E,2010. • Charles R. Smith, G. W. Tracy, and R. Lance Farrar, "Applied Reservoir Engineering", Vol I and Vol 2-OGCI Publications,1992 • Boyan Guo and Ali Ghalambor,"Natural Gas Engineering Handbook", Gulf Publishing Company,2nd Edition,2005 (latest Edition). •	

