PE-318 Drilling Engineering-II

Credit Hour
Theory = 3
Practical = 1

Course Content

Wellbore hydraulics
Design of circulation system, hydrostatic pressure in gas and liquid columns.Hydrostatic pressure in complex fluid columns.Annular pressure during well control operations.Non- static well conditions.Rheological Model (Newtonian and Non- Newtonian model).Mud hydraulics.

Casing design
Casing design procedures, collapse, burst and tension. Abnormal pressures prediction and well control. Fracture gradient prediction. Well design for safety and efficiency.

Cementation design
Types of Cement, Purpose of Cement, Cement Characterization, Cement Additives, Slurry Design, Cementation Equipment, Cementation Procedure, Cement Plug. Design of primary and secondary cementing jobs.Liner cementing, setting of cement plugs.

Bit selection
Bit selection & evaluation of wear penetrating cementing. Flow through jet bits. Jet bit nozzle selection.

Directional & horizontal drilling
Directional drilling, wellbore surveying techniques. Horizontal drilling, coiled tubing drilling. BHA design for vertical and directional wells. Torque and drag calculation, pipe buckling

Relief Wells
Applications of Relief Well, Planning, Phases, Tools (PMR, AMR), Well intersection Design Principle

Planning and budgeting
Planning, budgeting and cost control ofdrilling operation, tangible and intangible expenditure.

Sectorial Guidelines for drilling operations

Relevant Guidelines for Environmental Assessment Techniques Policy, Legislation, Protected Areas in Pakistan

Text book

1. M. E. Hossain, M. R. Islam,"Drilling Engineering Problems and Solutions: A Field Guide for Engineers and Students", 1st Edition, Scrivener Publishing LLC, 2018.

Reference Book

1. Rabia, H. “Well Engineering & Construction”. Entrac Consulting Limited, London, 2002.
2. A.T. BourgoyneJr, K.K. Millheim, “Applied Drilling Engineering”, SPE Textbook Series Vol. 2, ISBN: 978-1-55563-001-0, 1991