

# Well Construction and Pumping test

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## Summary Syllabus

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First day:

- Evaluation of well drilling methods according to geological and condition
- Component of safe and Reliable Well
- Well Most Vulnerable to Microbiological and Chemical Contamination
- Main Steps of Well Construction
- Site Selection for Drilling of Well
- Well Drilling Methods
- Primary Drilling Method
- Function of Drilling Fluid
- Kind of Drilling Fluid
- Advantage and Disadvantage of Direct Mud Rotary
- Practical Work
- Reverse Circulation Drilling Method
- Reverse Air Drilling Method
- Cable Tools Percussion Drilling Method
- Advantage and Disadvantage of Percussion Drilling Method
- Practical Work
- Auger Method
- Hand Drilling Well Method
- Well Design

Second day:

- Secondary Drilling Method
- Mechanical drilling Well
- Drilling Method According to the Using
- Selection of Drilling Method According to the Geological-Technical Condition
- Direct Mud Rotary
- Hosting Equipment
- Rooting Equipment
- Circulating Equipment
- Type of Drilling Bits
- Type of Drilling Bite According to Hardness of Rock

- Drilling Time Log
- Format for field data
- Field requirement and management
- Field measurement during pump test
- Time drawdown measurement
- Flow rate measurement
- Time Recovery Measurement data
- Geophysical Well Logging Documentation ,Evaluation ,Selection of Screen interval
- Sieve Analysis
- Selection of Screen Slot and Gravel Packing size according to the Sieving Analysis
- Selection of Borehole Diameter Casing Screen and Material
- Practical Work(Calculation of Volume of gravel pack and grot)

Third day:

- Well Hydraulic Analysis and Evaluation of Pumping Test Data
- Basic Concepts and Definition
- Aquifer, Aquitard, Aquiclude and Aquifuge
- Confined Aquifer ,Unconfined Aquifer ,Leaky Aquifer and Purched
- Discharge Zone and Recharge Zone
- Drawdown , Well Yield and Specific yield
- Water and Geology instruction
- Groundwater resources evaluation
- Groundwater versus contamination evaluation
- Groundwater flow
- Physical parameters
- Porosity
- Hydraulic conductivity
- Hydraulic conductivity ,Transmasivity
- Darcy Low
- Well Pumping test
- Well design ,site map
- Select of pump for pumping test
- Water level measurement devices
- Physical measurement devices
- Sample bottle
- Discharge measurement devices
- Duration of the pumping test

Fourth day

- Purposes of Well Development
- Method and Procedures
- Over Pumping
- Back Washing

- Air lift
- High Velocity Jetting
- DACAAR Experience
- Solution to Well Drilling Problem

Fifth day:

- Analysis and Evaluation of Pumping data
- Plot of Time Drawdown Data in Simi logarithmic (group)
- Plot of Time Recovery Data on the Simi Logarithmic (graph)
- Plot Pumping Test Data on Simi Logarithmic graph
- Calculation of Aquifer Parameters
- Course finishing
- Certificate

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