Apprentice Pump Installer & Pump Installer License Study Topics

Definitions and Terminology
- Design of water pump system
- Unconfined and confined aquifers
- Static water level
- Drawdown
- Specific Capacity
- Cone of depression
- Pumping water level
- Recovery
- Yield
- Vacuum
- Types of pumps & components
- Adding stages to well pump
- Types of valves
- Psi
- Water mining
- Total dynamic head
- 2-wire submersible pump motors
- Intermediate storage tank
- Resistance scales
- Compound gauge
- Backspin
- Calibrating an ohmometer
- Types of submersible pumps
- Recovery test
- Pump altitude
- Water table
- Types of tests
- Cone of depression
- Maximum yield
- Hydrologic cycle
- Water Mining
- Groundwater recharge
- Fishing
- Turbidity
- Permeability
- Types of valves
- Adding stages to a pump
- Pipe capacity (volume)
- Well vacuum
- Internal seal mechanisms

Conversions / Math
- 1 psi = 2.31 ft of head
- Flow versus Pressure
- Maximum yield
- Measuring pump motor amperage

Safety
- Eye protection
- Causes of electrocution
- Acetylene torches
- Status of circuit breaker
- Injuries on site
- Hydrogen Sulfide

State Regulations
- Violations
- Potability of a well
- Change of employment
- Hydrogeologic Areas 1-5
- Production of well system
- “Miss Utility”
- Voltage
- Well permits
- MOSHA
- Protective devices for all pumps
- Installation completion of a pump
- Domestic water supply system standards
<table>
<thead>
<tr>
<th>Maintenance/troubleshooting</th>
<th>Electrical</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Air-bound</td>
<td>- 3-phase submersible pump motor</td>
</tr>
<tr>
<td>- Pressure: start-up/shut-off</td>
<td>- Circuit breaker</td>
</tr>
<tr>
<td>- Water level measurement tools</td>
<td>- Power supply</td>
</tr>
<tr>
<td>- Pump tests</td>
<td></td>
</tr>
<tr>
<td>- Groundwater quality</td>
<td></td>
</tr>
<tr>
<td>- Iron</td>
<td></td>
</tr>
<tr>
<td>- Servicing a well</td>
<td></td>
</tr>
<tr>
<td>- Limit of horizontal/vertical length of a suction pipe</td>
<td></td>
</tr>
<tr>
<td>- Start-up/shut-off pressure</td>
<td></td>
</tr>
<tr>
<td>- Causes of leaks in pipes and pumps</td>
<td></td>
</tr>
<tr>
<td>- Pressure switch</td>
<td></td>
</tr>
<tr>
<td>- Chlorine disinfection</td>
<td></td>
</tr>
<tr>
<td>- Pumping sand</td>
<td></td>
</tr>
<tr>
<td>- Airlock of suction line</td>
<td></td>
</tr>
<tr>
<td>- Causes of a blown fuse in a pump</td>
<td></td>
</tr>
<tr>
<td>- Over-pumping &amp; air-bound of a submersible pump</td>
<td></td>
</tr>
<tr>
<td>- Water-hammer</td>
<td></td>
</tr>
<tr>
<td>- 2 centrifugal pumps in a series/in parallel</td>
<td></td>
</tr>
<tr>
<td>- Motor winding resistance</td>
<td></td>
</tr>
<tr>
<td>- A pipe’s coefficient of friction</td>
<td></td>
</tr>
<tr>
<td>- Location of a pump</td>
<td></td>
</tr>
<tr>
<td>- Design of a water pumping system</td>
<td></td>
</tr>
</tbody>
</table>