



## **Petroleum Services Bachelor of Science Degree**

### **Program Goals:**

Graduates of the Bachelor of Science degree in Petroleum Services with a concentration in Exploration and Production or Safety Technology will be able to:

1. Demonstrate critical thinking and problem solving abilities using basic principles of *scientific concepts*.
2. Prepare technical information within project teams in a professional manner.
3. Set personal career and financial goals, including personal investment, planning, financial management and a life-long learning plan.
4. Obtain gainful entry level employment leading to leadership positions in the regional, national and global energy industry.
5. Demonstrate technical competencies within the petroleum services degree and their chosen concentration of study (exploration and production or safety technology).

### **Concentration Core Competencies (Petroleum Services Bachelor of Science):**

Graduates of the Bachelor of Science degree in Petroleum Services in Exploration and Production or Safety Technology concentrations will demonstrate the following knowledge, skills and abilities:

1. Interpret and apply information pertaining to business or operations (e.g. regulations; industry consensus standards; reference databases; injury and illness statistics; etc.) to case studies and technical problems using appropriate data.
2. Explain the operational scope, application and purpose that compose the three separate and discrete sectors of the petroleum industry (upstream, midstream and downstream).
3. Explain the oil field vocabulary, common methods, typical materials, tools and equipment that are used in the oil and gas industry.
4. Apply general economic theory to assess viability of petroleum engineering projects, calculate return on investment and determine injury and illness loss impact on company profitability.
5. Evaluate risk and operational practices in accordance with accepted survey methodology (e.g., observing the facility; referring to process flow charts; PID's, verifying safety and health systems; auditing programs and documentation; and interviewing applicable stakeholders) in order to recognize hazards and controls.
6. Effectively formulate, communicate and implement solutions to technical and HSE problems in a professional environment.
7. Investigate incidents, near misses and operational failures using established techniques to determine root causes, identify trends and formulate or update corrective action plans.
8. Design, develop, deliver and manage health, safety and environmental training following industry accepted practices.
9. Demonstrate leadership abilities to effectively work and interact in a team environment.
10. Achieve industry recognized certification for well control, production safety systems and health, safety & environmental practices.

**Core Competencies with Concentration in Exploration and Production (PSEP):**

The Petroleum Services Bachelor of Science Exploration and Production concentration pathway consist of 7 courses (21 credit hours). In addition to the ten (10) core competencies above, graduates of the Bachelor of Science degree in Petroleum Services Exploration and Production concentration will demonstrate the following knowledge, skills and abilities identified as PSEP-c:

11. Explain wellbore design and calculate bottom-hole pressures to maintain well integrity.
12. Explain basic well completion steps taken to transform a drilled well into a producing one (e.g., casing, cementing, perforating, gravel packing and installing production tree).
13. Apply well logging data with basic core data in order to understand property formation lithology, porosity, permeability and fluid saturation given basic rock-fluid system data.
14. Assess and respond to abnormal operating conditions during the drilling or production process where inherent catastrophic risks are involved (lost circulation, high pressure zones, etc.)
15. Describe primary, secondary and enhanced oil production methods involving extraction of hydrocarbons.
16. Calculate mud weight necessary to maintain well control and volume of mud required to fill the hole while pulling drill pipe from the well.
17. Understand causes of well kicks, positive indications of kicks, and six common well control methods for controlling kicks while drilling.
18. Explain process safety controls and methods involving level, pressure, flow and temperature in a production safety system.