



## Course Syllabus

### **ENER 1350 – Overview of Energy Industry**

*Revision Date: 1/11/2017*

**Catalog Description:** Introduction to the major sectors of the energy industry. Includes a comparison of energy industry careers.

**Lecture hours = 2, Lab hours = 3**

**Prerequisites:** none

**Semester Credit Hours:** 3

**Lecture Hours per Week:** 2

**Lab Hours per Week:** 3

**Contact Hours per Semester:** 80

**State Approval Code:** 15.0503

**Instructional Goals and Purposes:** The purpose of this course is to introduce the student to the major sectors of the energy industry including fossil fuels and alternative energy systems. An overview of the entire energy industry focusing heavily on petroleum based energy; Purposes and proper procedures in a variety of petroleum technologies; exploration, drilling, production, transportation, marketing, and refining. Exploring various alternative energy systems.

Learning Outcomes:

1. Explain the fundamentals of geology pertaining to oil and gas reservoirs.
2. Discuss the types of exploration techniques.
3. List the principles of leasing land for the right to drill in the area.
4. Explain the fundamentals of drilling an oil or gas well.
5. Identify what has been found, through a series of steps including logging, testing, and completing.
6. Understand the behavior of the hydrocarbon activity in the reservoir.
7. Explain the different methods of production.
8. List the methods of transporting oil or gas products.
9. Discuss the basic procedures for refining, processing and marketing oil and gas.
10. List the environmental and health concerns pertaining to the production and use of oil and gas products.
11. Discuss alternative energy sources including CNG, wind energy and solar energy.
12. Identify the players involved in the production and marketing of the oil and gas products.

#### **Specific Course Objectives (includes SCANS):**

After studying all materials and resources presented in the course, the student will be able to:

1. **Explain the fundamentals of geology pertaining to oil and gas reservoirs.** (SCANS 1ci, 1civ, 2ai, 2aiii, 2ci, 2cii, 2ciii)
  - a. Determine which geographical features are mostly likely to contain oil and gas.

- b. Define rock types
  - c. Identify fold types
  - d. Distinguish between porosity and permeability.
  - e. Describe the makeup of hydrocarbons in the reservoir.
2. **Discuss the types of exploration techniques.** (SCANS 1ci, 1civ, 2ai, 2aiii, 2ci, 2cii, 2ciii)
    - a. Discuss various techniques and instruments used to help determine the location of oil and gas reservoirs.
  3. **List the principles of leasing land for the right to drill in the area.** (SCANS 1ci, 1civ, 2ai, 2aiii, 2ci, 2cii, 2ciii)
    - a. Define the difference between the lessee and the lessor.
    - b. Discuss how ownership of the oil, gas and mineral resources are established.
    - c. Determine the three essential provisions of a lease.
    - d. Explain the land and mineral owner's rights of ownership and royalty provisions.
  4. **Explain the fundamentals of drilling an oil or gas well.** (SCANS 1ci, 1civ, 2ai, 2aiii, 2ci, 2cii, 2ciii)
    - a. Distinguish between the different drilling techniques.
    - b. Determine the three factors that affect the rate of penetration of a bit.
    - c. Discuss the equipment used in the drilling process and the role it plays.
  5. **Identify what has been found, through a series of steps including logging, testing, and completing.** (SCANS 1ci, 1civ, 2ai, 2aiii, 2ci, 2cii, 2ciii)
    - a. Distinguish between various types of logging.
    - b. Describe the types of testing that are performed.
    - c. Describe the completion process and the equipment involved.
  6. **Understand the behavior of the hydrocarbon activity in the reservoir.**
    - a. Discuss the significance of phase diagrams.
    - b. Determine the differences between saturated and unsaturated oil.
  7. **Explain the different methods of production.** (SCANS 1ci, 1civ, 2ai, 2aiii, 2ci, 2cii, 2ciii)
    - a. Discuss the difference between natural flow wells and artificial lift.
    - b. Define the various methods used to boost production with secondary and tertiary recovery.
  8. **List the methods of transporting oil or gas products.** (SCANS 1ci, 1civ, 2ai, 2aiii, 2ci, 2cii, 2ciii)
    - a. Define the various methods of transportation.
  9. **Discuss the basic procedures for refining, processing and marketing oil and gas.** (SCANS 1ci, 1civ, 2ai, 2aiii, 2ci, 2cii, 2ciii)
    - a. Discuss the various types of separators.
    - b. Discuss the process of treating oil and gas.
    - c. Discuss water disposal.
    - d. Define the factors that are used to calculate flow.
    - e. Discuss meter types.
  10. **List the environmental and health concerns pertaining to the production and use of oil and gas products.** (SCANS 1ci, 1civ, 2ai, 2aiii, 2ci, 2cii, 2ciii)
    - a. Define the environmental acts that affect the oil and gas industry.
    - b. Determine the agencies that play a role in regulating industry standards.
  11. **Discuss alternative energy sources including CNG, wind energy and solar energy.** (SCANS 1ci, 1civ, 2ai, 2aiii, 2ci, 2cii, 2ciii)
    - a. Discuss the use of CNG as an alternative energy source.
    - b. Discuss the process of collecting energy from both wind and solar sources.
  12. **Identify the players involved in the production and marketing of the oil and gas products.** (SCANS 1ci, 1civ, 2ai, 2aiii, 2ci, 2cii, 2ciii)
    - a. Distinguish between the various career opportunities in the oil and gas industry.

**Course Content:** A general description of lecture/discussion topics included in this course are listed in the Learning Objectives / Specific Course Objectives sections of this syllabus.

Students in all sections of Supervision will be required to do the following:

1. Students will complete quizzes and assignments based on the material provided for the course.

2. Students will complete online objective exams. For the online section Test 2 and the Final Exam will be in the presence of a testing proctor.

**Methods of Instruction/Course Format/Delivery:** Content for the course will be delivered using lecture, textbook content and online instruction. Students in traditional, hybrid and Internet classes will have access to courses via Canvas. Students in the traditional class will meet regularly for lecture. Students in the Internet class will be required to take quizzes and exams at an approved testing facility or, they may also be administered by the instructor. Students in hybrid classes will have both in class and online assignments. Resources for this course, provided through Canvas, include the following Sections in Canvas....

- Modules: Chapter study materials, self-assessment exercises, quizzes and exams
- Announcements and Recent Activities List: Instructor Announcements
- Inbox: Email (to communicate with instructor and classmates inside Canvas)
- Grades: Student grades
- Other sections, as assigned by the Instructor: Students in both the traditional and Internet classes should use the People feature within Canvas (includes Canvas Email) to communicate with the instructor. Using Canvas Email located in the "In Box" menu, gives the student access to the instructor and other classmates without having to remember or type email addresses; the student just selects a name from the list. The instructor will attempt to respond to all Canvas email within a timely manner. Please always include in the subject line of the Canvas email, the student's name, course number and course section number.

**Assessment:**

The following items will be assigned during the semester and used to calculate the student's final grade:

- **Quizzes and Assignments**
  - Students will read the required material and complete quizzes and assignments over the content. The ability to makeup late quizzes and assignments will be determined by the instructor for a reduced score.
- **Tests**
  - There will be three tests. In the online section the second test will be given in the Testing Center locations only. Students are only allowed ONE makeup test per semester due to an excused absence with the approval of the instructor.
- **Final Exam**
  - The Final Exam will be cumulative. In the online section the Final will be given in the Testing Center locations only.

**Course Grade:**

The grading scale for this course is as follows:

- Quizzes and Assignments – 25%
- Tests – 50%
- Final Exam – 25%

## Grading Notes:

**Missed Exams:** Missed exams due to legitimate reasons should be taken prior to the reporting of mid-term or final grades as applicable. It is the responsibility of the student to reschedule the makeup with the instructor. The Instructor reserves the right to change the test format of any makeup. Instructors are not required to makeup work for an unexcused class absence. The Instructor also reserves the right to give full or partial credit for any makeup work that is allowed and that resulted from an unexcused absence.

**Missed Quizzes:** Missed quizzes due to legitimate reasons should be rescheduled within one week of the scheduled quiz or a date assigned by the Instructor. It is the responsibility of the student to reschedule makeup quizzes. The Instructor reserves the right to change the test format of the makeup quiz. Instructor is not required to makeup work for unexcused class absences. Instructor reserves the right to give full or partial credit for any make up work that is allowed and that resulted from an unexcused absence.

**Attendance:** Attendance is based on the student missing no more than 10% out of the semester without a valid excuse. After the 10% the instructor may withdraw the student at their discretion. Any student thirty or more minutes late will be counted absent. Students that leave before class is dismissed will be counted absent. The Instructor reserves the right to dock points for any missed class without a legitimate excuse.

**Plagiarism:** Plagiarism shall be defined as appropriating, buying, receiving as a gift or obtaining by any other means, another person's work and the unacknowledged submission or incorporation of it in one's own written work. All papers submitted to Canvas will be scanned with turnitin.com and the instructor reserves the right to dock points based on the results.

**Cheating:** Cheating on a test shall include:

- a. Copying from another student's test
- b. Using test materials not authorized by the person administering the test
- c. Collaborating with or seeking aid from another student during a test without permission from the test administrator
- d. Knowingly using, buying, selling, stealing, or soliciting, in whole or in part, the contents of an unadministered test.
- e. The unauthorized transporting or removal, in whole or in part, of the contents of the unadministered test.
- f. Substituting for another student, or permitting another student to substitute for one's self, to take a test.
- g. Bribing another person to obtain an unadministered test or information about an unadministered test. Absolutely no cheating is tolerated.
- h. If a student is observed cheating they will be sent home immediately counted absent and given a zero on the assignment they were cheating on.

**Class Conduct:** All cell phones should be turned off and put away in all classes. If you must receive a call notify your instructor before class begins and step out of the classroom. The use of cell phones (texting, calls, internet, ect.) during class will result in points being taken from the students Test grades.

**Grading Scale** A=90-100, B=80-89, C=70-79, D=60-69, F=69 and below

A student that chooses to NOT finish the course must complete the withdrawal procedure in the Student Success office in order to receive a —W. Otherwise, the student will receive a grade at the end of the semester commensurate with the work completed.

Students needing special classroom or testing accommodations because of physical or learning disabilities must contact the Student Success office before these services will be made available in the classroom.

**Texts, Materials, and Supplies:**

- Title: *Fundamentals of Petroleum: Fifth Edition*  
Published by: The University of Texas: PETEX

Required Readings:

- Title: *Fundamentals of Petroleum: Fifth Edition*  
Published by: The University of Texas: PETEX

Recommended Readings:

- None

**Other:**

- For current texts and materials, use the following link to access bookstore listings: <http://www.panolacollegestore.com>
- For testing services, use the following link: <http://www.panola.edu/elearning/testing.html>
- If any student in this class has special classroom or testing needs because of a physical learning or emotional condition, please contact the ADA Student Coordinator in Support Services located in the Administration Building or go to <http://www.panola.edu/student-success/disability-support-services/> for more information.
- Withdrawing from a course is the student's responsibility. Students who do not attend class and who do not withdraw will receive the grade earned for the course.
- Student Handbook, *The Pathfinder*: <http://www.panola.edu/student-success/documents/pathfinder.pdf>

## SCANS CRITERIA

### 1) **Foundation skills are defined in three areas: basic skills, thinking skills, and personal qualities.**

- a) **Basic Skills:** A worker must read, write, perform arithmetic and mathematical operations, listen, and speak effectively. These skills include:
  - i) Reading: locate, understand, and interpret written information in prose and in documents such as manuals, graphs, and schedules.
  - ii) Writing: communicate thoughts, ideas, information, and messages in writing, and create documents such as letters, directions, manuals, reports, graphs, and flow charts.
  - iii) Arithmetic and Mathematical Operations: perform basic computations and approach practical problems by choosing appropriately from a variety of mathematical techniques.
  - iv) Listening: receive, attend to, interpret, and respond to verbal messages and other cues.
  - v) Speaking: Organize ideas and communicate orally.
- b) **Thinking Skills:** A worker must think creatively, make decisions, solve problems, visualize, know how to learn, and reason effectively. These skills include:
  - i) Creative Thinking: generate new ideas.
  - ii) Decision Making: specify goals and constraints, generate alternatives, consider risks, and evaluate and choose the best alternative.
  - iii) Problem Solving: recognize problems and devise and implement plan of action.
  - iv) Visualize ("Seeing Things in the Mind's Eye"): organize and process symbols, pictures, graphs, objects, and other information.
  - v) Knowing How to Learn: use efficient learning techniques to acquire and apply new knowledge and skills.
  - vi) Reasoning: discover a rule or principle underlying the relationship between two or more objects and apply it when solving a problem.
- c) **Personal Qualities:** A worker must display responsibility, self-esteem, sociability, self-management, integrity, and honesty.
  - i) Responsibility: exert a high level of effort and persevere toward goal attainment.
  - ii) Self-Esteem: believe in one's own self-worth and maintain a positive view of oneself.
  - iii) Sociability: demonstrate understanding, friendliness, adaptability, empathy, and politeness in group settings.
  - iv) Self-Management: assess oneself accurately, set personal goals, monitor progress, and exhibit self-control.
  - v) Integrity and Honesty: choose ethical courses of action.

### 2) **Workplace competencies are defined in five areas: resources, interpersonal skills, information, systems, and technology.**

- a) **Resources:** A worker must identify, organize, plan, and allocate resources effectively.
  - i) Time: select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
  - ii) Money: Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
  - iii) Material and Facilities: Acquire, store, allocate, and use materials or space efficiently. Examples: construct a decision time line chart; use computer software to plan a project; prepare a budget; conduct a cost/benefits analysis; design an RFP process; write a job description; develop a staffing plan.
- b) **Interpersonal Skills:** A worker must work with others effectively.
  - i) Participate as a Member of a Team: contribute to group effort.
  - ii) Teach Others New Skills.
  - iii) Serve Clients/Customers: work to satisfy customer's expectations.

- iv) **Exercise Leadership:** communicate ideas to justify position, persuade and convince others, responsibly challenge existing procedures and policies.
- v) **Negotiate:** work toward agreements involving exchange of resources, resolve divergent interests.
- vi) **Work with Diversity:** work well with men and women from diverse backgrounds.

Examples: collaborate with a group member to solve a problem; work through a group conflict situation, train a colleague; deal with a dissatisfied customer in person; select and use appropriate leadership styles; use effective delegation techniques; conduct an individual or team negotiation; demonstrate an understanding of how people from different cultural backgrounds might behave in various situations.

- c) **Information:** A worker must be able to acquire and use information.

- i) **Acquire and Evaluate Information.**
- ii) **Organize and Maintain Information.**
- iii) **Interpret and Communicate Information.**
- iv) **Use Computers to Process Information.**

Examples: research and collect data from various sources; develop a form to collect data; develop an inventory record-keeping system; produce a report using graphics; make an oral presentation using various media; use on-line computer data bases to research a report; use a computer spreadsheet to develop a budget.

- d) **Systems:** A worker must understand complex interrelationships.

- i) **Understand Systems:** know how social, organizational, and technological systems work and operate effectively with them.
- ii) **Monitor and Correct Performance:** distinguish trends, predict impacts on system operations, diagnose deviations in systems' performance and correct malfunctions.
- iii) **Improve or Design Systems:** suggest modifications to existing systems and develop new or alternative systems to improve performance.

Examples: draw and interpret an organizational chart; develop a monitoring process; choose a situation needing improvement, break it down, examine it, propose an improvement, and implement it.

- e) **Technology:** A worker must be able to work with a variety of technologies.

- i) **Select Technology:** choose procedures, tools or equipment including computers and related technologies.
- ii) **Apply Technologies to Task:** understand overall intent and proper procedures for setup and operation of equipment.
- iii) **Maintain and Troubleshoot Equipment:** Prevent, identify, or solve problems with equipment, including computers and other technologies.

Examples: read equipment descriptions and technical specifications to select equipment to meet needs; set up and assemble appropriate equipment from instructions; read and follow directions for troubleshooting and repairing equipment.

**Missed Quizzes:** Missed quizzes due to legitimate reasons should be rescheduled within one week of the scheduled quiz or a date assigned by the Instructor. It is the responsibility of the student to reschedule makeup quizzes. The Instructor reserves the right to change the test format of the makeup quiz. Instructor is not required to makeup work for unexcused class absences. Instructor reserves the right to give full or partial credit for any make up work that is allowed and that resulted from an unexcused absence.

**Attendance:** Attendance is based on the student missing no more than 10% out of the semester without a valid excuse. After the 10% the instructor may withdraw the student at their discretion. Any student thirty or more minutes late will be counted absent. Students that leave before class is dismissed will be counted absent. The Instructor reserves the right to dock points for any missed class without a legitimate excuse.

**Plagiarism:** Plagiarism shall be defined as appropriating, buying, receiving as a gift or obtaining by any other means, another person's work and the unacknowledged submission or incorporation of it in one's own written work. All papers submitted to Canvas will be scanned with turnitin.com and the instructor reserves the right to dock points based on the results.

**Cheating:** Cheating on a test shall include:

- a. Copying from another student's test
- b. Using test materials not authorized by the person administering the test
- c. Collaborating with or seeking aid from another student during a test without permission from the test administrator
- d. Knowingly using, buying, selling, stealing, or soliciting, in whole or in part, the contents of an unadministered test.
- e. The unauthorized transporting or removal, in whole or in part, of the contents of the unadministered test.
- f. Substituting for another student, or permitting another student to substitute for one's self, to take a test.
- g. Bribing another person to obtain an unadministered test or information about an unadministered test. Absolutely no cheating is tolerated.
- h. If a student is observed cheating they will be sent home immediately counted absent and given a zero on the assignment they were cheating on.

**Class Conduct:** All cell phones should be turned off and put away in all classes. If you must receive a call notify your instructor before class begins and step out of the classroom. The use of cell phones (texting, calls, internet, ect.) during class will result in points being taken from the students Test grades.

Grading Scale A=90-100, B=80-89, C=70-79, D=60-69, F=69 and below

A student that chooses to NOT finish the course must complete the withdrawal procedure in the Student Success office in order to receive a —W. Otherwise, the student will receive a grade at the end of the semester commensurate with the work completed.

Students needing special classroom or testing accommodations because of physical or learning disabilities must contact the Student Success office before these services will be made available in the classroom.

**Texts, Materials, and Supplies:**



- Title: *Fundamentals of Petroleum: Fifth Edition*  
Published by: The University of Texas: PETEX

**Other:**

- For current texts and materials, use the following link to access bookstore listings: <http://www.panolacollegestore.com>
- For testing services, use the following link: <http://www.panola.edu/elearning/testing.html>
- If any student in this class has special classroom or testing needs because of a physical learning or emotional condition, please contact the ADA Student Coordinator in Support Services located in the Administration Building or go to <http://www.panola.edu/student-success/disability-support-services/> for more information.
- Withdrawing from a course is the student's responsibility. Students who do not attend class and who do not withdraw will receive the grade earned for the course.
- Student Handbook, *The Pathfinder*: <http://www.panola.edu/student-success/documents/pathfinder.pdf>

## SCANS CRITERIA

### 3) **Foundation skills are defined in three areas: basic skills, thinking skills, and personal qualities.**

- a) **Basic Skills:** A worker must read, write, perform arithmetic and mathematical operations, listen, and speak effectively. These skills include:
  - i) Reading: locate, understand, and interpret written information in prose and in documents such as manuals, graphs, and schedules.
  - ii) Writing: communicate thoughts, ideas, information, and messages in writing, and create documents such as letters, directions, manuals, reports, graphs, and flow charts.
  - iii) Arithmetic and Mathematical Operations: perform basic computations and approach practical problems by choosing appropriately from a variety of mathematical techniques.
  - iv) Listening: receive, attend to, interpret, and respond to verbal messages and other cues.
  - v) Speaking: Organize ideas and communicate orally.
- b) **Thinking Skills:** A worker must think creatively, make decisions, solve problems, visualize, know how to learn, and reason effectively. These skills include:
  - i) Creative Thinking: generate new ideas.
  - ii) Decision Making: specify goals and constraints, generate alternatives, consider risks, and evaluate and choose the best alternative.
  - iii) Problem Solving: recognize problems and devise and implement plan of action.
  - iv) Visualize ("Seeing Things in the Mind's Eye"): organize and process symbols, pictures, graphs, objects, and other information.
  - v) Knowing How to Learn: use efficient learning techniques to acquire and apply new knowledge and skills.
  - vi) Reasoning: discover a rule or principle underlying the relationship between two or more objects and apply it when solving a problem.
- c) **Personal Qualities:** A worker must display responsibility, self-esteem, sociability, self-management, integrity, and honesty.
  - i) Responsibility: exert a high level of effort and persevere toward goal attainment.
  - ii) Self-Esteem: believe in one's own self-worth and maintain a positive view of oneself.
  - iii) Sociability: demonstrate understanding, friendliness, adaptability, empathy, and politeness in group settings.
  - iv) Self-Management: assess oneself accurately, set personal goals, monitor progress, and exhibit self-control.
  - v) Integrity and Honesty: choose ethical courses of action.

### 4) **Workplace competencies are defined in five areas: resources, interpersonal skills, information, systems, and technology.**

- a) **Resources:** A worker must identify, organize, plan, and allocate resources effectively.
  - i) Time: select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
  - ii) Money: Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
  - iii) Material and Facilities: Acquire, store, allocate, and use materials or space efficiently. Examples: construct a decision time line chart; use computer software to plan a project; prepare a budget; conduct a cost/benefits analysis; design an RFP process; write a job description; develop a staffing plan.
- b) **Interpersonal Skills:** A worker must work with others effectively.
  - i) Participate as a Member of a Team: contribute to group effort.
  - ii) Teach Others New Skills.
  - iii) Serve Clients/Customers: work to satisfy customer's expectations.

- iv) **Exercise Leadership:** communicate ideas to justify position, persuade and convince others, responsibly challenge existing procedures and policies.
- v) **Negotiate:** work toward agreements involving exchange of resources, resolve divergent interests.
- vi) **Work with Diversity:** work well with men and women from diverse backgrounds.

Examples: collaborate with a group member to solve a problem; work through a group conflict situation, train a colleague; deal with a dissatisfied customer in person; select and use appropriate leadership styles; use effective delegation techniques; conduct an individual or team negotiation; demonstrate an understanding of how people from different cultural backgrounds might behave in various situations.

- c) **Information:** A worker must be able to acquire and use information.

- i) **Acquire and Evaluate Information.**
- ii) **Organize and Maintain Information.**
- iii) **Interpret and Communicate Information.**
- iv) **Use Computers to Process Information.**

Examples: research and collect data from various sources; develop a form to collect data; develop an inventory record-keeping system; produce a report using graphics; make an oral presentation using various media; use on-line computer data bases to research a report; use a computer spreadsheet to develop a budget.

- d) **Systems:** A worker must understand complex interrelationships.

- i) **Understand Systems:** know how social, organizational, and technological systems work and operate effectively with them.
- ii) **Monitor and Correct Performance:** distinguish trends, predict impacts on system operations, diagnose deviations in systems' performance and correct malfunctions.
- iii) **Improve or Design Systems:** suggest modifications to existing systems and develop new or alternative systems to improve performance.

Examples: draw and interpret an organizational chart; develop a monitoring process; choose a situation needing improvement, break it down, examine it, propose an improvement, and implement it.

- e) **Technology:** A worker must be able to work with a variety of technologies.

- i) **Select Technology:** choose procedures, tools or equipment including computers and related technologies.
- ii) **Apply Technologies to Task:** understand overall intent and proper procedures for setup and operation of equipment.
- iii) **Maintain and Troubleshoot Equipment:** Prevent, identify, or solve problems with equipment, including computers and other technologies.

Examples: read equipment descriptions and technical specifications to select equipment to meet needs; set up and assemble appropriate equipment from instructions; read and follow directions for troubleshooting and repairing equipment.