Colorado CTE

Fossil Energy Extraction, Processing & Distribution (2015): Grades 9, 10, 11, 12, Higher Education

Adopted 2015

Evaluate and analyze the role of fossil fuels in providing the world energy needs. FSEP.01

01. Analyze fossil fuels as a principle of energy science. FSEP.01.01

- a. Identify the main types of fossil fuels (e.g. crude oil, natural gas, coal). FSEP.01.01.A
- b. Describe the byproducts of fossil fuels and their effects on the environment. FSEP.01.01.B
- c. Discuss the formation of fossil fuels and their potential as an energy source in the future. FSEP.01.01.C
- d. Describe the primary process for extracting energy from fossil fuels. FSEP.01.01.D
- e. Correlate the positive and negative aspects of fossil fuels as an energy source. FSEP.01.01.E

02. Examine the classifications of fossil fuel technology. FSEP.01.02

- a. Critique natural gas as a fuel source and its transformation from methane to carbon dioxide and water vapor. FSEP.01.02.A
- b. Critique fuel oil as a fuel source and its transformation from carbon and hydrogen to carbon dioxide and water. FSEP.01.02.B
- c. Critique coal as a fuel source and its transformation from carbon and hydrogen to carbon dioxide and water. FSEP.01.02.C
- d. Differentiate among the utilizations of the types of fossil fuels (e.g., transportation, electric generation, heating). FSEP.01.02.D

03. Analyze the types of technologies developed to make use of coal. FSEP.01.03

- a. Describe the functions and operations of crushers, pulverizers and stokers. FSEP.01.03.A
- b. Explain the functions and operations of circulating and bubbling fluidized beds. FSEP.01.03.B

Skip to main content

c. Discuss the functions and operations of integrated gasification combined cycles. FSEP.01.03.C

04. Explain the issues affecting the transportation and storage of fossil fuels. FSEP.01.04

a. Explore the technical issues affecting the compression and transportation of natural gas. FSEP.01.04.A

b. Explore the technical issues affecting the transportation, heating and aboveground storage of fuel oil. FSEP.01.04.B

c. Explore the technical issues affecting the transportation, storage and handling of bituminous coal, sub-bituminous coal and lignite. FSEP.01.04.C

d. Analyze the economic issues affecting modes of transportation, handling, storage and distribution of fossil fuels. FSEP.01.04.D

05. Explain how fossil fuels are utilized to produce electrical energy. FSEP.01.05

a. Describe the functions of fossil fuel systems (e.g., air and gas flow, water and steam, wastewater, ash and ash byproduct) in generating plants. FSEP.01.05.A

b. Describe and diagram the function of the turbine generator in generating plants. FSEP.01.05.B

c. Explain and diagram the function of the generator step-up (GSU) transformer and switchyard. FSEP.01.05.C

06. Explain the issues and trends affecting the extraction, distribution and storage of fossil fuels FSEP.01.06

a. Describe the major barriers to extracting fossil fuels from the earth. FSEP.01.06.A

b. Contrast current and projected levels of consumption to available resources. FSEP.01.06.B

c. Discuss the political complications with obtaining raw resources from foreign sources. FSEP.01.06.C

d. Examine the capacity of the U.S. fossil fuel processing industries to meet future consumption. FSEP.01.06.D

e. Analyze the current condition of the distribution and storage network (e.g., pipelines, freighters, tankards, distribution centers). FSEP.01.06.E

f. Compare consumption in terms of time of day, demand and peak power available. FSEP.01.06.F

07. Explain the process and techniques used in fossil fuel exploration and extraction. FSEP.01.07

a. Differentiate between common rocks and minerals associated with petroleum. FSEP.01.07.A

b. Understand sedimentary rocks deformation and basic oil traps. FSEP.01.07.B

Skip to main content

c. Explore fundamental mapping methods. FSEP.01.07.C

d. Understand mapping layers using geographic information systems. FSEP.01.07.D

e. Perform simple global positioning maneuvers using a handheld GPS device. FSEP.01.07.E

f. Recognize source rocks and the generation, migration, and accumulation of petroleum. FSEP.01.07.F

g. Differentiate between the various types of petroleum exploration techniques. FSEP.01.07.G

h. Explore the mechanics of drilling a well. FSEP.01.07.H

i. Examine various artificial lift methods. FSEP.01.07.I

j. Understand fluid surface treatments and storage. FSEP.01.07.J

k. Recognize the similarities and differences between onshore and offshore drilling and production methods. FSEP.01.07.K