TAFTCOLLEGE

Energy (ENER) 1630 Energy Analytics (3 units) CSU

Advisory: Successful completion of COSC 1703 and COSC 1902 strongly recommended.

Hours and Unit Calculations: 48 Hours Lecture + 96 Outside of class Hours (144 Total Student Learning Hours) = 3 Units

Catalog Description: This course is a study of data management systems employed by organizations in the energy industry. Students learn to develop and use spreadsheets and databases for common data collection, management, and problem solving as found in datasets, scenarios, and case studies common to oil, gas, wind, solar, and other energy industries. Fieldtrips may be required.

Type of Class/Course: Degree/Credit

Text:
Etheridge, Denise. *Excel Data Analysis: Your Visual Blueprint for Creating and Analyzing Data, Charts and PivotTables,* 3rd ed., Wiley, 2011.

Conrad, Jeff. *Microsoft Access 2013 Inside Out.* O'Reilly Media, 2013.

Course Objectives:

By the end of the course a successful student will be able to:
1. understand data types and data organization,
2. use energy related databases to retrieve and analyze production, geological, and/or reservoir data for modeling and decision analysis,
3. demonstrate the ability to extract any type of dataset and convert to an analytical format,
4. use spreadsheets to import, extract, and analyze data,
5. create templates, import data, and query data for reporting,
6. perform troubleshooting, problem solving, or decision analysis as appropriate, and
7. present findings and conclusions in oral or written format.

Course Scope and Content

Unit I: Data Types and Organization of Data
      A. Develop Data Types – Static, Dynamic, Calculated
      B. Use data structures and data formats
      C. Format different and multiple datasets

        D. Import data sets and formatting it for data analysis
        E. Merge and link datasets for analysis

Unit II: Using Spreadsheets
        A. Explore the layout of spreadsheets
        B. Design spreadsheets to analyze various types of data
        C. Create multiple worksheets to analyze data

Unit III: Introduction to Database
        A. Compare features of a database
        B. Create databases to capture required data
        C. Use data queries to extract information
        D. Create and print reports

Unit IV: Applied Energy Analytics
        A. Extract various data sets found in various energy industries
        B. Analyze various data sets found in various energy applications
        C. Map, graph, and make visual displays of data sets
        D. Generate reports
        E. Create models to forecast from data
        F. Analyze case studies
        G. Work on projects using specific energy industry data

Unit V: Troubleshooting and Problem Solving
        A. Use case studies and data to analyze, evaluate, and solve problems
        B. Troubleshoot scenarios and make recommendations arising from data analysis

Learning Activities Required Outside of Class:
The students in this class will spend a minimum of 6 hours per week outside regular class time doing the following:
      1. Studying class notes
      2. Answering questions
      3. Completing required reading
      4. Performing problem solving activities or exercises
      5. Doing written assignments
      6. Participating in group projects

Methods of Instruction:
      1. Lectures
      2. Case Studies
      3. Assigned problems from the text
      4. Multimedia presentations
      5. Group explorations
      6. Case studies and scenario roleplay
      7. Field Trips
      8. Scenarios

Methods of Evaluation:

Writing assignments, including
- A. a reports
- B. topic paper written under American Psychological Association (APA) style guide
- C. critical chapter reflections
- D. case studies
- E. scenarios
- F. simulations
- G. projects

Problem-solving demonstrations, including:
- A. exams
- B. homework problems
- C. scenarios
- D. case study recommendations and solutions

Other summative examinations using combinations of:
- A. multiple choice questions
- B. matching items
- C. true/false questions
- D. short answer questions
- E. fill in the blank responses

Participation including:
- A. role-playing and group activities
- B. oral presentations and demonstrations
- C. discussion responses
- D. scenario reflections

Projects including:
- A. multimedia presentations
- B. scenario responses
- C. action plans
- D. formal written reports
- E. building new case studies

Supplemental Data:

TOP Code:	095430: Petroleum Technology
Sam Priority Code:	C: Clearly Occupational
Funding Agency:	Y: Not Applicable

Program Status:	1: Program Applicable
Noncredit Category:	Y: Not Applicable, Credit Course
Special Class Status:	N: Course is not a special class
Basic Skills Status:	N: Course is not a basic skills course
Prior to College Level:	Y: Not Applicable
Cooperative Work Experience:	No
Eligible for Credit by Exam:	Yes
Eligible for Pass/No Pass:	Yes