|  |
| --- |
| **ENRG 51 – Excel for Energy AuditingCOURSE DESCRIPTION:** Overview of Microsoft Excel as used for common engineering applications, with a focus on energy savings calculations. It covers Excel basics, such as navigation techniques, key-pad short cuts, graphing, and calculations. Advanced topics include regressions, pivot tables, lookup, dates and macros. |
| **36 Hours (18 lecture, 18 lab)** |

|  |
| --- |
| **LEARNING OUTCOMES:** |
| * Demonstrate fundamental use of spreadsheet basics.
* Create and interpret graphs.
* Illustrate the use of Excel's built-in functions and the functions commonly used by engineers
* Interpret simple regression analysis directly from graph data using various trend lines
* Create and apply macros and pivot tables on existing data
 |
| **COURSE TOPICS:** |
| 1. Excel fundamentals

A. Starting ExcelB. Basic concepts and terminologyC. Spreadsheet basicsD. Formatting, printing, saving, opening and editing new and existing workbooks1. Creating and interpreting graphsA. Importing text files

B. Creating an XY scatter plotC. Editing an existing graphD. Creating graphs with multiple curvesE. Printing graphs1. Excel Functions

 A. Introduction to Excel functions B. Excel's built-in functions 1. Elementary math functions 2. Advanced math functions 3. Date and time functions 4. String functions 5. Lookup and reference functions 6. File-handling functions 7. Functions for working with database C. Using the CONVERT ( ) function to convert units D. Error function1. Regression AnalysisA. Introduction to linear regression function

B. Exploring linear regression with Excel's trend line capabilityC. Evaluating two-coefficient linear regression modelsD. Analyzing polynomial regressionE. Applying regression analysis to energy data1. Excel MacrosA. Introduction to common macros commands, formulas, and functionsB. Programmed macros 1. Module, subs, and functions 2. Running macros 3. Saving a macro project 4. Using a programmed macro from another workbook
 |
| **TYPES OF ASSIGNMENTS:** |
| 1. In-class A) Class discussions B) Solve problem sets from real world energy data using Excel C) Analyze energy savings calculations with Excel D) Analyze imported data such as Typical Meteorological Year, version 3 (TMY3)
2. Out-of-class A) Readings from text, websites or instructor handouts B) Solve problem sets from real world energy data using Excel C) Prepare written report to "client" explaining energy calculations or analysis performed using Excel
 |
| **TEXTBOOKS & RESOURCES:** |
| * MS Word and Excel help resources
* Instructor generated handouts on topics such as Regression Analysis or Macros
 |