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Overview

Course Description

This 15-hour course is designed for appraisal professionals who want to use Microsoft® Excel to apply statistical methods in solving valuation problems. The course employs Excel's data analysis add-in and charting capabilities to assist in developing descriptive statistics and in using simple linear regression analysis to estimate linear relationships between two variables. Topics include descriptive statistics, scatter plots, an introduction to simple linear regression, assumptions underlying application of linear regression modeling, nonlinear curve-fitting, prediction and forecasting, data sufficiency, and separation of pooled data by submarket. Participants will be engaged in hands-on learning, discovering and applying basic statistical methods to data sets that illustrate each session's objectives in a valuation context. This course will help you gain a solid understanding of simple linear regression analysis and be prepared for more advanced multiple linear regression study.

Upon completion of the course, participants should be able to

- Understand and validate the assumptions underlying linear regression analysis.

- Develop credible estimates of outcome variable values and associated confidence intervals.

- Interpret Excel's linear regression outputs.

- Transform nonlinear relationships into linear equivalents for analysis.

- Develop forecasts from time-series data.

This course is one of a series of courses that are part of the Appraisal Institute's Analytics for Valuation Professional Development Program. For more information about the program, see Professional Development Programs on the Appraisal Institute website at www.appraisalinstitute.org.

Learning Enhancements

The course has been designed with a variety of elements to enhance your learning experience.

- ***Preview.*** To give you a taste of what is to come, each part begins with a preview page, which includes learning objectives to consider as you move through the content and learning tips that will assist you in understanding the information presented.

- ***Learning Objectives.*** Each learning objective covers information you need to fully understand the concepts in the course. Look them over before each part begins

so that you have a frame of reference as you move through the material. At the end of each part, reread the objectives. Are you able to perform what is stated? If not, this is the time to ask your instructor for help or review the concepts that you do not understand.

- *Discussion Questions.* Discussion questions provide you with additional ideas to consider as you absorb what you are learning.

- *Examples.* Supplementing the discussions, we've included examples to help you visualize and practice what you are learning.

- *In-Class Exercises.* These exercises provide you with additional hands-on practice as you absorb what you are learning.

- *Fill-in-the-Blanks.* It is a proven fact that when you write something down, you are more apt to remember it. The course handbook has "missing" content in the outline that you will need to add in the space provided in your handbook as the instructor goes over the content.

- *Review Quizzes.* Quizzes are included at the end of Parts 3, 6, and 11. The multiple-choice questions are similar to the questions you might find on the exam. Other questions use fill-in-the-blank answers to review terms, concepts, and techniques that might be tested on the exam.

- *Review.* Each part concludes with a review. Included in the review are the learning objectives and key terms and concepts covered. In addition, we've provided recommended readings from other sources that will reinforce what you have learned in class.

- *Digging Deeper.* Throughout the course you will find content labeled Digging Deeper. Generally, the instructor will not cover this material in class. More advanced participants or those looking for an extra challenge can refer to the Digging Deeper sections while the rest of the class is finishing up work on individual or small group activities. Content identified as Digging Deeper will not appear on the exam. **However, appraisers preparing for the Comprehensive Exam should be familiar with it, as well as all other material contained in the course handbook, whether or not it is presented in class.**

Classroom Guidelines

To make the course a positive experience for everyone attending, please follow these guidelines when class is in session.

- 100% attendance is required. No exceptions.

- Limit use of laptops to classroom projects.

- Communicate with business associates during break time instead of class time.

- Put away reading materials such as newspapers and books that are not used in class.

- Silence cell phones and other communication devices.

- Use recording devices only if prior permission has been granted.

- Refrain from ongoing conversations with those seated near you and other distracting behavior.

General Information

- **Breaks.** There will be two 10-minute breaks during each half-day session unless noted otherwise by the program sponsor. The lunch break is one hour. A meal is not provided unless specified in the sponsor's advertising or in your course confirmation materials.

- **Attendance sheets** will be distributed during class to verify your attendance during each half-day session. Attendance for the entire course is required.

- **Certificates of completion** may be downloaded after completion of the course, and attendance during the entire course is required.

Required Equipment and Downloads

- **Calculator.** A four-function calculator is required for the exam. Some devices such as the Apple Phone have an HP-12C emulator application. However, because such devices *may not be used during the final exam*, you will need to bring an acceptable calculator to class.

  Important Note. Laptops, cellular phones, tablets, iPads, wearable technology (smart watch, Apple Watch, Google Glass, etc.) and other devices that can store data or connect to the Internet are *NOT* permitted during the exam. In addition, all watches, wallets, bags, and purses must be removed and stored out of reach prior to taking the exam.

- **Laptop computers and Microsoft Excel 365** are required. A laptop computer is required. All participants are expected to have a laptop computer with Microsoft Excel 365 loaded and operating. You can download a free evaluation copy (good for 60 days) at http://office.microsoft.com/en-us/try/. **Note.** Microsoft periodically changes its website. If the link doesn't work, go to www.microsoft.com and look under Office and then Office Trials for the download links.

- **Solver Add-in and Analysis ToolPak Add-in.** All participants must have the Solver Add-in and Analysis ToolPak Add-in installed prior to class. **Note.** These add-ins may not work with the online version of Excel. As a result, it is highly recommended that you download a computer-based version of Excel.

- All participants must download the Excel files used for in-class exercises and problems. These can be downloaded with your other class materials and should be on your hard drive in an easy to locate folder.

Recommended Text

The following text is strongly recommended:

- Marvin L. Wolverton, PhD, MAI, *An Introduction to Statistics for Appraisers* (Chicago: Appraisal Institute, 2009)

Prerequisites

Recommended course/seminar

- *Real Estate Finance, Statistics, and Valuation Modeling*

- *Using Spreadsheet Programs in Real Estate Appraisals—The Basics* or similar course/seminar

Participants must have basic knowledge of spreadsheets, particularly Excel.

Exam

- 25 multiple-choice questions