Course 334 – Application of Mass Appraisal to Non-Residential Properties

Course Description

Application of Mass Appraisal to Non-Residential Properties is IAAO's advanced course on the mass appraisal of income properties, including non-residential land, apartments, offices, retail, and warehouse properties. The course begins with an overview of market forces affecting commercial properties, key data characteristics for each property type, market stratification, and assembling and screening income and other relevant market data. The course then discusses specification and calibration of non-residential models and features seven labs on the development sales comparison, cost, and income models for various property types. Three of the labs use Microsoft Excel and four use IBM's Statistical Package for the social Sciences (SPSS). Labs comprise approximately two-thirds of the course. The course concludes with discussions of value review and defense and a comparable sales lab. Students will come away with a deep understanding of the use of modeling software to aid in the application of all three approaches to non-residential property valuation.

Objectives

Upon completion of Chapter 1, you should be able to:
• Describe the four factors affecting commercial property values.
• Identify important factors specific to apartments, office, retail, and industrial values.
• Identify the cycles through which neighborhoods progress and explain how they can affect the relationship between highest and best and current use.
• Define the two key criteria used to stratify commercial properties.
• Provide examples of property substrata applicable to apartment, office, and retail properties.
• Explain why the same geographic boundaries cannot be used for all commercial property types.
• List several factors of prime importance to occupants and investors in apartment, office, retail, and warehouse/industrial spaces.
• Explain why cost, income, and sales data are all important in the appraisal of commercial properties.
• List four methods of obtaining income and expense information from property owners.
• Identify several third-party sources of income and expense information.
• Distinguish model specification from model calibration.
• Use the basic formulation of the cost, income, and sales comparison approaches.
• List three statistical methods for calibrating mass appraisal models.
• Explain several tools available for evaluating the reliability of mass appraisal models.

Upon completion of Chapter 2, you should be able to:
• Distinguish model variables, coefficients, and terms.
• Explain the differences between additive, multiplicative, and hybrid models.
• List the advantages and limitations of additive, multiplicative, and hybrid models.

• Categorize a given model as additive, multiplicative, or hybrid.

• Specify and interpret the coefficients in a multiplicative model.

• List several requirements for the development of a successful model.

• Identify and explain MRA assumptions.

• List several objectives of exploratory data analysis (EDA).

• Give examples of appropriate applications of bar and pie charts, histograms, scatter graphs, line graphs, and box plots.

• Explain how to interpret a box plot.

• Describe the role and importance of variable transformations in the modeling process.

• Provide an example of binary, scalar, spline, multiplicative, quotient, exponential, and logarithmic transformations that might be used in a commercial model.

• Explain the use and interpretation of a correlation matrix.

• Interpret the coefficient of determination (R^2) and the standard error of estimate (SEE).

• Interpret the following measures of variable importance: standard error, t-value, p-value, and beta coefficient.

• Convert the coefficient for a time variable (MONTHS) into time-adjustment factors.

• Explain how stepwise and backward regression can facilitate model development.

• Explain how to evaluate the accuracy and uniformity of values produced by a sales comparison model.

Upon completion of Chapter 3, you should be able to:

• Explain the labor theory of value and principle of substitution.

• Write an equation describing the cost approach.

• Define the difference between replacement and reproduction costs.

• Describe the role of market adjustment factors in the cost approach.

Upon completion of Chapter 4, you should be able to:

• Explain the appraisal principle of anticipation.

• Define the four basic steps in the income approach.

• Explain the two approaches to estimating PGI, typical expenses, and other components of the income approach.

• Enumerate typical units of comparison used in PGI models for apartments, retail, office, industrial, and hotel/motel properties.

• Explain the difference between gross and net income and how overage rents and pass-through expenses can be handled.

• List the key variables in PGI models for apartments, retail properties, office buildings, and warehouse/industrial properties.

• Understand how a statistical software package can be used to develop a PGR or PGI model.

• Know how to specify and interpret the coefficients in income models.

• Know how to test predicted values developed by income models.

• List expenses that are allowable and not allowable for mass appraisal.

• Describe the primary determinants of expense ratios.

• Explain the difference between discount rates and overall capitalization rates and why they might diverge.

• Explain the relative advantages and limitations of stratification analysis and overall rate models for the development of capitalization rates.

• Explain the advantages and disadvantages of GIM models.

Upon completion of Chapter 5, you should be able to:

• List the several components or tasks that comprise the value review process.

• List information that should be included on summary value review reports.

• Know the IAAO ratio study standards for commercial properties.

• List items that should be included on "one-liner" value review reports.

• List the advantages and disadvantages of traditional field review of values.

• Explain how modern technology can be leveraged in the value review process.

• Explain when value overrides are appropriate and not appropriate and caveats that should be followed in overriding values.

• List several criteria for evaluating value acceptability.

• Describe how assessors can help ensure valuation consistency and list factors that contribute to inconsistencies.

• Identify and briefly describe three ways of finding comparables sales or properties.

• Distinguish between Euclidean and Minkowski distance metrics.

Timetable

Topic	Time Requirement	Day Covered
Chapter 1		
Market Forces Affecting Non-Residential Properties	20 Minutes	Monday AM
Market Stratification	20 Minutes	Monday AM
Relevant Location and Improvement Characteristics	20 Minutes	Monday AM
Relevant Market Data	10 Minutes	Monday AM
Collecting and Screening Income and Expense Data	15 Minutes	Monday AM
Third Party Sources of Income and Expense Data	10 Minutes	Monday AM
Non-Residential Model Specification	20 Minutes	Monday AM
Model Calibration and Quality Control	20 Minutes	Monday AM
Review Questions	15 Minutes	Monday AM
Chapter 2		
Additive, Multiplicative, and Hybrid Model Structures	60 Minutes	Monday AM
Role of MRA	5 Minutes	Monday AM
Requirements of Successful Models	10 Minutes	Monday AM
MRA Assumptions	45 Minutes	Monday PM
Exploratory Data Analysis	45 Minutes	Monday PM
Data Transformations	45 Minutes	Monday PM
Interpret a Correlation Matrix	10 Minutes	Monday PM

Topic	Time Requirement	Day Covered
Measures of Goodness-of-Fit	10 Minutes	Monday PM
Measures of Variable Importance	15 Minutes	Monday PM
Stepwise & Backward Regression	10 Minutes	Monday PM
Lab 2-1: Additive Commercial Land Model	195 Minutes	Monday PM/Tuesday AM
Lab 2-2: Multiplicative Land Model	135 Minutes	Tuesday AM
Review Questions	15 Minutes	Tuesday AM
Chapter 3		
Economic Principles Underlying the Cost Approach	10 Minutes	Tuesday AM
Structure of Commercial Cost Models	15 Minutes	Tuesday AM
Stratification by Building Type	10 Minutes	Tuesday AM
Estimate Building Costs	15 Minutes	Tuesday AM
Cost Manuals	20 Minutes	Tuesday PM
Lab 3-1: Determine Economies of Scale	60 Minutes	Tuesday PM
Formula-Driven Cost Models	20 Minutes	Tuesday PM
Develop Market-Based Depreciation Schedules	45 Minutes	Tuesday PM
Lab 3-2: Developing a Market-Derived Depreciation Schedule	75 Minutes	Tuesday PM
Market-Adjustment Factors	15 Minutes	Tuesday PM
Review Questions	15 Minutes	Tuesday PM
Chapter 4		
Appraisal Principle and Underlying the Income Approach	5 Minutes	Tuesday PM
General Approaches to Income Models	10 Minutes	Wednesday AM
Specify and Analyze Per Unit Rents	10 Minutes	Wednesday AM
Potential Gross Income Model	195 Minutes	Wednesday AM
Vacancy Rate Analysis	15 Minutes	Wednesday AM
Lab 4-1: Apartment PGI Model	205 Minutes	Wednesday AM/PM
Expense Allowances	15 Minutes	Wednesday PM
Overall Rate Determination	15 Minutes	Wednesday PM
Lab 4-2: Develop an Overall Rate Model	165 Minutes	Thursday AM

Topic	Time Requirement	Day Covered
GIM Models	15 Minutes	Thursday AM
Review Questions	75 Minutes	Thursday AM/PM
Chapter 5		
Role of Value Review in Mass Appraisal	10 Minutes	Thursday PM
Summary Value Review	15 Minutes	Thursday PM
Review of Individual Values	15 Minutes	Thursday PM
Aspects of Value Acceptability	15 Minutes	Thursday PM
Comparables Analysis	15 Minutes	Thursday PM
Lab 5-1: Summary Value Review: Office Buildings	45 Minutes	Thursday PM
Lab 5-2: Individual Value Review: Retail Properties	60 Minutes	Thursday PM
Lab 5-3: Comparable Analysis: Industrial Properties	15 Minutes	Thursday PM
Review Questions	10 Minutes	Thursday PM