# Table of Contents

**Overview** ........................................................................................................................................... ix

**Course Schedule** ................................................................................................................................. xiii

**SECTION 1**

**Part 1. Introduction and Overview**

- Preview Part 1 ........................................................................................................................................ 1
- Diagnostic Quiz ........................................................................................................................................ 3
- Introduction to Discounted Cash Flow (DCF) ...................................................................................... 6
- Yield Capitalization Using DCF Analysis Procedure ............................................................................ 10
- Uses of Market Analysis in DCF ........................................................................................................... 11
- Review Part 1 ......................................................................................................................................... 13
- Review Quiz .......................................................................................................................................... 14
- Six Functions of One Summary ............................................................................................................... 16

**Part 2. Components of Discounted Cash Flow Analysis**

- Preview Part 2 ........................................................................................................................................ 17
- Return on and Return of Capital ........................................................................................................... 19
- Holding and Projection Period ............................................................................................................... 34
- Yield and Discount Rates ...................................................................................................................... 34
- Review Part 2 ......................................................................................................................................... 37
- Review Quiz .......................................................................................................................................... 38

**Part 3. Forecasting Cash Flows**

- Preview Part 3 ........................................................................................................................................ 41
- First-Year Reconstructed Operating Statement .................................................................................... 43
- Forecasting Gross Income ..................................................................................................................... 43
- Operating Expenses ............................................................................................................................... 46
- Net Operating Income .......................................................................................................................... 52
- Below-the-Line Expenses .................................................................................................................... 52
- Estimating Reversions for DCF Analysis ............................................................................................... 63
- Review Part 3 ......................................................................................................................................... 69
- Section 1 Practice Test ......................................................................................................................... 71
### SECTION 2

**Part 4. Property Discounted Cash Flow Analysis Using Overall Yield Rate**

<table>
<thead>
<tr>
<th>Preview Part 4</th>
<th>73</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield Capitalization Principles</td>
<td>75</td>
</tr>
<tr>
<td>Yield Rates</td>
<td>76</td>
</tr>
<tr>
<td>General Discounted Cash Flow Formula</td>
<td>78</td>
</tr>
<tr>
<td>Review Part 4</td>
<td>93</td>
</tr>
</tbody>
</table>

**Part 5. Property Discounted Cash Flow Analysis Using Overall Yield Rate, cont.**

<table>
<thead>
<tr>
<th>Preview Part 5</th>
<th>95</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF₀ and CFᵢ for Periodic Payments in Arrears</td>
<td>97</td>
</tr>
<tr>
<td>Present Value, Net Present Value, and Internal Rate of Return</td>
<td>98</td>
</tr>
<tr>
<td>Level-Equivalent Annuities</td>
<td>111</td>
</tr>
<tr>
<td>Review Part 5</td>
<td>117</td>
</tr>
</tbody>
</table>

**Part 6. Property Discounted Cash Flow Analysis Using Overall Yield Rate, cont.**

<table>
<thead>
<tr>
<th>Preview Part 6</th>
<th>119</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split-Rate Discounting</td>
<td>121</td>
</tr>
<tr>
<td>Income in Advance</td>
<td>129</td>
</tr>
<tr>
<td>More Frequent Compounding Periods</td>
<td>136</td>
</tr>
<tr>
<td>Common Errors in Discounted Cash Flow Analysis</td>
<td>139</td>
</tr>
<tr>
<td>Review Part 6</td>
<td>151</td>
</tr>
<tr>
<td>Section 2 Practice Test</td>
<td>153</td>
</tr>
</tbody>
</table>

### SECTION 3

**Part 7. Mortgages**

<table>
<thead>
<tr>
<th>Preview Part 7</th>
<th>157</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solving for Payment</td>
<td>159</td>
</tr>
<tr>
<td>Solving for Loan Balance</td>
<td>163</td>
</tr>
<tr>
<td>Solving for Term</td>
<td>171</td>
</tr>
<tr>
<td>Variable Rate Mortgages</td>
<td>173</td>
</tr>
<tr>
<td>Review Part 7</td>
<td>175</td>
</tr>
</tbody>
</table>

**Part 8. Mortgages, cont.**

<table>
<thead>
<tr>
<th>Preview Part 8</th>
<th>177</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash Equivalence</td>
<td>179</td>
</tr>
<tr>
<td>Measures of Lender Risk</td>
<td>189</td>
</tr>
<tr>
<td>Review Part 8</td>
<td>193</td>
</tr>
</tbody>
</table>
SECTION 4

Part 10. Equity Valuation

Preview Part 10 .......................................................................................... 207
Estimating the Value of Mortgage and Equity Interests .......................... 209
Equity Valuation ...................................................................................... 209
Overstream Office Building Case Study ................................................. 210
Brooktown Office Building Case Study ................................................. 223
Review Part 10 ....................................................................................... 227

Part 11. Lease Analysis

Preview Part 11 ....................................................................................... 229
Review of Lease Terminology ................................................................ 231
Valuing Lease Interests ........................................................................ 233
Single-Tenant Case Study ..................................................................... 236
Overstream Office Building Case Study ................................................. 244
Review Part 11 ....................................................................................... 247

Part 12. Equity and Lease Analysis Review

Preview Part 12 ....................................................................................... 249
Section 4 Practice Test .......................................................................... 251
Review Part 12 ....................................................................................... 253

SECTION 5

Part 13. Discounted Cash Flow Review

Preview Part 13 ........................................................................................ 255
Types of Income Capitalization ................................................................. 257
Property Model ........................................................................................ 259
Review Part 13 ....................................................................................... 261
Review Quiz ............................................................................................ 262
Part 14. Income Patterns

Preview Part 14................................................................................................................. 263
Introduction .................................................................................................................. 265
Level Income Pattern ............................................................................................... 266
Irregular Income Pattern ............................................................................................. 272
Compound Rate of Change Income Pattern ............................................................. 275
Review Part 14 ............................................................................................................. 279
Review Quiz .................................................................................................................. 280

Part 15. Introduction to Property Models: Solving for Value

Preview Part 15................................................................................................................. 283
What Is a Property Model? ......................................................................................... 285
Property Model Format ............................................................................................... 286
How the Model Works ................................................................................................. 287
Two Property Model Premises ..................................................................................... 297
Problem Recognition Quiz .......................................................................................... 300
Road Map for Unleveraged Property Models ............................................................. 302
Review Part 15 ............................................................................................................. 303
Section 5 Practice Test ............................................................................................... 305

SECTION 6

Part 16. Introduction to Property Models: Solving for Yield and Change in Value

Preview Part 16................................................................................................................. 307
Solving for Y .................................................................................................................. 309
Solving for Value Change ............................................................................................ 314
Review Part 16 ............................................................................................................. 323
Review Quiz .................................................................................................................. 324

Part 17. Property Model Applications

Preview Part 17................................................................................................................. 325
Residual Techniques ...................................................................................................... 327
Case Study Problems .................................................................................................... 337
Grouped Problems ....................................................................................................... 341
Review Part 17 ............................................................................................................. 351
Overview

Course Description

After a diagnostic quiz on the six financial functions of One and a brief review, General Appraiser Income Approach/Part 2 opens with a thorough treatment of discounted cash flow (DCF) analysis. Topics include identifying components of a DCF, projecting cash flows, analyzing leases, solving for value in a variety of common situations, and supporting the discount rate. The effects of debt financing including cash equivalence and equity analysis are covered in detail. Income patterns and property models including residual and other applications are followed by selecting and supporting the discount rate. Also presented are the strengths and weaknesses of direct and yield capitalization. The final section reviews and summarizes the mathematical concepts involved with income capitalization and prepares the participant for not only the course exam but also the certification exam.

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, you will find a Preview page that begins each Part. Included on the Preview page is a brief overview of the content, learning objectives to consider as you move through the content, and learning tips that will assist you in understanding the information you’re about to learn.

- **Learning Objectives.** Each learning objective covers essential information you need to know to fully understand the concepts in the course. Look them over before the 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 do what is stated? If not, this is the time to ask your instructor for help or review the concepts that you do not understand.

- **Review.** Each Part concludes with a Review page. Included in the review are the learning objectives and key terms and concepts that have been covered. Also, we’ve provided recommended readings from textbooks that will reinforce what you have learned in class.

- **Digging Deeper.** Digging Deeper information goes beyond the scope of the course and is not intended to be covered in class. It is not tested on the course 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.
Additional Notes Regarding Effective Learning in this Course

In this course, we’ll use a variety of learning exercises. To assist you in learning, see the additional notes below.

- **Fill-in-the-Blanks.** Definitions are given for all terms, but some require you to write in the term. The terms are shown on the instructor’s PowerPoint slides and in the Solutions Booklet.

- **Examples.** These are usually fully answered in the Course Handbook; occasionally they might be shown on the PowerPoint as a minor fill-in-the-blank exercise.

- **Problems.** Questions are presented in the Course Handbook. Solutions are provided in the Solutions Booklet.

- **Discussion Topics.** Topics are posed in the Course Handbook. Solutions are provided in the Solutions Booklet. You may also want to take notes on the ensuing class discussions or from the PowerPoint slides.

- **Thought Questions.** Questions are posed in the Course Handbook; answers are included in the Solutions Booklet.

- **Case Studies.** Throughout the Appraisal Institute’s curriculums, case studies of varying length and complexity are used to help participants apply what they have learned. The cases are often worked in groups. Answers are included in the Case Studies Solutions Booklet.

- **Practice Quizzes.** Quiz questions follow most Parts in the Course Handbook. Answers are in the Solutions Booklet.

- **Practice Tests.** Test questions are included at the end of each Section. They are presented in multiple-choice format. Answers are included in the Solutions Booklet.
Classroom Guidelines

To make the learning environment a positive experience for everyone attending, please follow these guidelines:

- 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.
- 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

- **Calculators.** A financial calculator is required. The model used in the course is the HP-12C. **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.

- **Breaks.** There will be two 10-minute breaks during the morning session and two 10-minute breaks during the afternoon session unless noted otherwise by the course sponsor. The lunch break is one hour.

- **Attendance sheets** will be distributed during class to verify your attendance during the morning and afternoon sessions.

- **Certificates of completion** will be e-mailed after completion of the course, and attendance during the entire course is required.

Recommended Texts

- *The Appraisal of Real Estate, 14th ed.*
- *Mathematics for Real Estate Appraisers*
- *Rates and Ratios Used in the Income Capitalization Approach*