

University of Pennsylvania  
The Wharton School

**Real Estate Finance: Investment and Analysis**  
**Fall 2020**  
**REAL/FNCE 721**

*Updated August 14, 2020*

Professor Ben Keys  
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Office Hours: Tuesdays, 3:00-4:30 p.m.  
and by appointment

**Course Objectives:**

- 1) To expose you to the terms, issues, and topics in commercial real estate;
- 2) To give you the basic skills and intuition you need to begin to evaluate a variety of real estate investments.

Real estate is a multi-faceted field, encompassing both an operating industry and a broad category of investments. It has its own institutional features, jargon, and investment structures. As the survey course in the Real Estate Department, this class aims to provide a broad overview of the real estate field, rather than a narrow focus on any particular topic. Higher-level classes in the Real Estate Department examine in more detail many of the topics from this class.

*The presumption in this class is that you have no prior real estate experience, and no pre-existing knowledge of the real estate industry is necessary to do well in this class.* However, if you have prior experience in the real estate industry, some topics might be familiar to you already.

Finance 611 (or 612) is a prerequisite for enrollment. In certain instances, the requirement may be waived for students with equivalent coursework in finance.

**Course Materials:**

**Readings:** There is no required textbook for the course. All readings are available on Canvas or can be accessed on line. Some readings are required (listed below with an asterisk \*) and students are expected to cover them before class. Many of these readings are necessary to complete problem set assignments that are due before class (see below). Other readings are optional, i.e. recommended but not required. Excerpts from the Linneman Kirsch textbook are available under “Course Materials@Penn Libraries”. Other readings are in the “Files>Readings” folder or linked to in the syllabus. One of the optional readings is available on Canvas via Study.net.

For students interested in learning more, we recommend the textbook *Real Estate Finance and Investments, 5<sup>th</sup> Edition*, by Linneman and Kirsch, from which many of the required readings are drawn. Additional textbooks are *Commercial Real Estate Analysis and Investments* by Geltner, Miller, Clayton, and Eicholtz and *Real Estate Finance and Investments* by Bruggeman and Fisher. Other interesting supplemental readings are *Investing in REITs* (Block) and *A Primer on Securitization* (Kendall and Fishman).

**Class notes:** Copies of the PowerPoint slides used in class will be posted in advance of class time. Even if the slides are posted well in advance, I often update and modify them a day or two before class, so you should plan to print out or download the most current version shortly before class. These slides are not designed to be a substitute for attending class.

**Financial Calculator:** You should be comfortable using either excel or a financial calculator capable of computing annuities and present values. You are also responsible for knowing how to use the annuity and present value functions. These calculations will be required on the exams. Any calculator able to perform the above functions will do, but we recommend and offer support for the HP 10b11+.

**Canvas:** I rely on Canvas to communicate with you and provide class materials:

- Class recordings
- Copies of the slides used in class
- Sample Excel spreadsheets from the in-class examples
- Problem sets (both required questions and practice problems) and other assignments
- Case materials
- Old exams (with solutions)
- Supplemental class material, such as newspaper articles
- Announcements, updates, and clarifications
- Discussion threads for Q+A (e.g., about a case)

### **Problem Sets:**

**Required questions:** These questions are due before class on the dates indicated on the calendar and should be submitted via Canvas. These questions are meant to help you think about a topic before we cover it in class and/or in preparation for a class discussion. Some of these questions are qualitative and don't have a right or wrong answer. Other questions are quantitative and have a correct answer, but I do not expect you to get it right – the goal is to make you think about a particular issue so that you can make the most out of class.

You should submit your answers to these questions via Canvas by 6pm the day before class. You may discuss the questions with other students, but each student should submit their own answer. The TAs and I will review your answers and you may be warm called

to expand on them in class. Your submissions will be graded as complete (“thumbs up”) or incomplete (“thumbs down”). You will get a thumbs up if you have made an effort to answer the question, even if the answer is not correct. You will get a thumbs down if you do not submit an answer or if your answer indicates that you have put minimal or no effort in working through the question.

**Practice problems:** Additional practice problems are meant to be done after class to consolidate your understanding of the material. These problems are not turned in and not graded, but they are essential to prepare for the exams. Solutions are provided. The TAs will hold *optional* review sessions throughout the semester (dates will be announced on Canvas) in which they will go over practice problems as well as old exams.

### Cases:

There will be four group-based cases, each of which will include a quantitative component (financial modelling) and a qualitative component.

You will choose your own case team of **three to four members**, and must work with the same team on all three cases. Your group may contain members from either of my sections, but not other professors’ sections. It is your responsibility to find a team. You and your teammates should sign up under the “team sign-up” section on Canvas before Case 1 is due. The cases require a variety of skills, from financial savvy to management. You should try to have a mix of talents and backgrounds on your team. In addition, I strongly discourage you from taking the “divide and conquer” approach of having only one or two team members work on each case.

You will be more successful if the group uses a truly collaborative process. **You are responsible for making your team work.** If you think a teammate is not working in good faith, or has neglected to finish her/his share of work, you must try hard to work it out within the group. If you still feel aggrieved after the case is turned in, send me and the case TA an email *before the case is graded*. If two or more serious complaints are registered against you by your group members, 20% will be deducted from your overall case grade. If I hear complaints about free-riding in the first group assignment, I will consider implementing a more structured peer assessment system.

You may discuss the cases with other groups and give and receive assistance. However, each group must separately prepare their own case materials and write-ups. Cases are to be submitted on Canvas by the due date and time reported in the syllabus, at which time submissions will be automatically locked. **Late cases will not be accepted nor will extensions be given.**

### Examinations:

**Workload:** Two midterm exams will be held in regularly scheduled class time. You must take the exam during your section time – no switching sections will be permitted.

- Monday, October 19th
- Monday, December 7th

**Material covered:** Exams will cover the material examined in class and during guest lectures, the class notes, the cases, the practice problems, and the required readings. Exam 2 is not cumulative in content, but assumes proficiency in basic skills taught in the first portion of the class.

**Passing the exams:** Both exams must be passed in order to receive a passing grade for the course.

**Exam makeups:** Exams must be taken at the assigned time. *If you know in advance that you will not be able to attend class on the exam dates, do not take this class.* Make-ups are not given unless you have a Wharton Dean's Office-approved excuse.

### Grading:

**Weights:** The course grade will be based on the following:

- Exams: 40 percent (20 percent each); you must pass each individually
- Cases: 60 percent (15 percent each, respectively)
- Class participation: Can contribute for up to a third of a letter grade (e.g. bump you up from an A- to an A) and is based on submissions to required questions, participation in class discussions, and attendance.

**Curve:** Each individual assignment is curved and the variance is standardized so no one assignment contributes more variance to your final grade than another. The curved scores are totaled for each student and the total is curved again within section. In practice, this means that your grade is determined by how many standard deviations your assignment scores are above or below your section's mean and whether you have correlated over- or underperformance across assignments.

**Regrades:** My policy on regrades is appended to the syllabus.

### Guest Speakers:

Guest speakers are scheduled outside of normal class time. These sessions are **required** material. These lectures are not videotaped so the guests feel comfortable speaking freely. You will need to get the notes from someone else if you are unable to attend. The guest lecturers are:

- Catherine Hong, Morgan Stanley
- Chris Lee, KKR
- Kara McShane, Wells Fargo

### "Classroom" Expectations:

**Be on time:** I will start on time and end on time. Do not arrive late.

**Attend your section:** That said, I understand that sometimes conflicts arise and I believe it is better to attend some class than no class, so contact me if you need to temporarily switch.

**Be prepared:** Complete the *required* readings in advance of the lecture and be ready to

comment on or discuss the class material.

**Participation:** Be willing to participate in class discussions, and to speak up if you're confused.

**Guest speakers:** Be present for the talks by outside speakers unless you have a conflict with another class.

**Technology Issues:** These will happen; Please be patient with me and your fellow classmates.

**Good sport:** I expect that you will not find every topic we cover to be of interest to you, but that you will be a good sport about it. Students who are considering a career in real estate development, for example, are interested in very different things than students who are considering a career on Wall Street. All the topics we will cover are of interest to someone in the class, but few are of interest to everyone. Please recognize that your classmates and you do not necessarily share the same tastes when I go into depth on a topic that you feel is not especially relevant to you.

### Getting help:

**Email:** Do not think that a question is too "basic" to ask me or the TAs. I am happy to help students understand any material they are having difficulty with. All I ask is that you take a serious stab at it yourself before turning to me. The Canvas discussion threads are also a good place to ask questions.

**Office hours:** I hold regular office hours Tuesdays from 3:00-4:30pm. Office hours will be held via Zoom on the link provided on Canvas. If you plan to attend office hours and would like to reserve a specific time slot just for yourself or you and your case team, **please sign up through Canvas**. I will also hold "drop-in" office hours, where I will be in a Zoom room and anyone from the class can join – this is the equivalent of having my office door open. Sign up on Canvas. If you can't make that time, email me and we'll schedule an appointment.

**TAs:** There are four TAs for the course. They will hold office hours to review problem sets, and for help in preparing for cases and midterms. The timing of these will be announced later.

- Chloe Ruan (chruan@wharton.upenn.edu)
- Warren Darakananda (dhanawat@wharton.upenn.edu)
- Aditya Singh (singhad@wharton.upenn.edu)
- Iman Tajadod (itajadod@wharton.upenn.edu)

### Disclaimers:

**Schedule:** The class schedule is an ambitious goal and may not reflect the actual timing, or even sequence, of covering material.

**Pass/fail:** Be aware that it is the policy of the Real Estate Department that students who take the class pass/fail cannot count the course toward the five credits necessary to complete the real estate concentration.

**Honor Code:** You may discuss the cases with other students who are currently enrolled. Each student (group) must separately prepare their own case materials and write-ups for the individual (group) assignments without reference to anyone else's case materials or write-ups. You may not share your written or Excel case materials, and you may not circulate suggested solutions to cases. Violations of these rules will be treated as violations of Penn's Code of Academic Integrity and will be strictly enforced and reported.

**Copyright Information:** All federal and state copyrights reserved for all original material presented in this course through any medium, including lecture and print. Any copyrighted material provided in this course is for your personal, noncommercial use and may not be copied and distributed to others without the prior permission of the copyright owner. Individuals are prohibited from being paid for taking or transferring their class notes without my express written permission.

**COVID Disclaimer:** This course is being taught in the midst of a global pandemic. I am deeply aware of and sympathetic to the challenges that students are facing both in and out of the classroom, and students should feel free to reach out to discuss any issues. My goal is to make the course as engaging as possible, and will need everyone's help to make that happen in the virtual classroom. I will maintain the highest standards, while of course allowing for flexibility given the circumstances. I welcome any comments on how to improve the course. Above all else, please be kind to one another.

## Tentative Course Schedule

Required readings are marked with an asterisk (\*). Other readings are optional.  
Required questions are provided in italics and due at 6pm the day before class.

Date	Topic	Preparation
1. September 2	Course requirements, class overview, and overview of real estate markets <b>Case #1 handed out</b>	<b>*(Refresher) Linneman, "Prerequisite I: The Basics of Discounted Cash Flow and Net Present Value Analyses," pp. 364-73</b> <b>*(Refresher) Linneman, "Prerequisite II: Internal Rate of Return," pp. 378-83</b>
<i>September 7</i>	<i>NO CLASS (LABOR DAY)</i>	
2. September 9	Elements of real estate value: income and expenses; pro-forma setup	<b>*Linneman, chapter 5: "Property Level Pro Forma Analysis," pp. 55-69</b>
3. September 14	Introduction to leases and the economics of retail malls	<b>*Linneman, chapter 4: "The Fundamentals of Commercial Leases," pp. 45-54</b>  <i>Required Question (RQ) 1: Retail leases</i>
4. September 16	Leases (continued) and property-level risk and return	<b>*Cornfield, "Leases are getting shorter and rents are dropping with U.S. office market in turmoil"</b>  <i>RQ2: Sensitivity Analysis</i>
5. September 21	Cap rates; Evaluating pro formas	<b>*Massachusetts Multifamily Pro Forma</b>  <b>Linneman, chapter 9: "The Use and Selection of Cap Rates"</b>  <i>RQ3: Evaluating the MA Pro Forma</i>
September 22	<b>Case #1 due before 9 a.m.</b>	
6. September 23		<b>Case #1 Discussion</b>
7. September 28	Mortgages and debt in the pro forma <b>Case #2 handed out</b>	<b>*Linneman, "Prerequisite III: Amortization Fundamentals," p. 384-96</b> <b>*Linneman, chapter 15: "The Use of Debt and Mortgages," pp. 225-233</b>  <i>RQ4: Mortgage Math Refresher</i>
8. September 30	Refinancing and the risks and reward of leverage	<b>*Linneman, chapter 15: "The Use of Debt and Mortgages," pp. 233-236</b> <i>RQ5: Refinancing</i>

9. October 5	Debt financing, land leases, hybrid structures, and partnerships	* <b>Linneman</b> , Chapter 17: “Ground Leases as a Source of Finance,” pp. 249-255 * <b>Maira</b> , “Understanding Real Estate Joint Ventures”  <i>RQ6: Hybrid Debt</i>
10. October 7	Taxes and real estate	* <b>Linneman</b> , chapter 5: “Property Level Pro Forma Analysis,” pp. 70-76 * <b>Sullivan</b> , “How Loopholes Help Trump and Other Real Estate Moguls Avoid Taxes”
11. October 12	<b>Case #2 due before 9 a.m.</b>	<b>Case #2 Discussion</b>
12. October 14	<b>Midterm Review</b>	* <b>“Getting to ATCF” Worksheet</b>
13. October 19	<b>Midterm Exam 1</b>	
14. October 21	Equity securitization and the REIT market <b>Case #3 handed out</b>	* <b>BofAML</b> REIT Primer, 6 <sup>th</sup> edition, pp. 1-7, 23-24 * <b>Bohalian and Cheigh</b> , “Buying the REIT Recovery in a Dislocated Market” * <b>Green Street Advisors</b> , “High Priced ≠ Overpriced”  <i>RQ7: REIT Valuation</i>
15. October 26	Equity securitization and the REIT market (continued)	* <b>Thomas</b> , “Bankrupted JC Penney plans to spin its properties into separate real estate company” * <b>Brewer</b> , “REIT Investors need to pay attention to this scary lawsuit”  <i>RQ8: Should you become a REIT?</i>
16. October 28	Securitization of debt interests: Commercial Mortgage-Backed Securities (CMBS)	* <b>Cibelli</b> , Lord Abbett Investment Brief, CMBS 2017
17. November 2	Securitization of debt interests: CMBS (continued) <b>Case #4 handed out</b>	* <b>Di Salvo and Johnston</b> , “Skin in the Game in the CMBS Market”  <i>RQ9: CMBS Warehousing Risk</i>
18. November 4	<b>Case #3 due before 9 a.m.</b>	<b>Case #3 Discussion</b>



19. November 9	Real estate cycles	<b>Smith</b> , Adjustment Mechanisms in Real Estate Markets ( <b>study.net</b> )  <b>Linneman, chapter 25</b> : “Real Estate Cycles,” pp. 344-358
20. November 11	Real estate cycles (continued) Housing markets	*Chinchilla, “Philly City Council votes to extend eviction ban as part of emergency aid to renters”  <i>RQ10: Cycles Problem Set</i>
21. November 16	Housing markets (continued) The rent/own decision in residential real estate	* <b>Falcone</b> , “Why Buying a Home is a Smart Investment for Millennials” * <b>Olick</b> , “It’s Better to Rent than Buy in Today’s Housing Market”  <i>RQ11: Should you buy or rent?</i>
22. November 18 (last day of in-person classes)	<b>Case #4 due before 9 a.m.</b>	<b>Case #4 discussion</b>
23. November 23	The rent/own decision in corporate real estate	* <b>Raice</b> , “Zynga to Spend \$228m on SF Property”  * <b>Takahashi</b> , “Zynga sells its SF HQ for \$600m”  * <b>Arata</b> , “How Coworking is Shaping the Office Market”  <b>Linneman, chapter 23</b> , “Corporate Real Estate Decision-Making,” pp. 320-33  <i>RQ12: Zynga’s Sale-Leaseback</i>
24. November 25	Appraisals and other valuation approaches	* <b>Keys</b> , “Why Automation is Killing the Property Appraisal Business,” <b>podcast+article on Canvas</b>
25. December 2	<b>Midterm Review</b>	
26. December 7	<b>Midterm Exam 2</b>	

***Regrade policy***

I strive for accuracy and equity in the grading for this class. However, despite my best efforts, grading is sometimes imperfect. The following set of rules provides a mechanism for requesting regrades to correct grading errors. If you do not follow these rules, you will forfeit your right to a regrade. The rules are designed to maintain fairness by not rewarding gratuitous regrade requests while also not penalizing students for bringing errors to my attention.

- **The onus for bringing any errors to my attention falls upon you. Review your assignments promptly** so you can check the grading and make sure that your grade on Canvas matches the grade on your assignment.
- **Regrade requests should be submitted by email.** Please explain clearly the alleged grading error.
- If you request a regrade, **the entire assignment will be reviewed. This means that your final grade may go up or down.** Errors tend to be random and offset each other. It would be unfair to the rest of the class to correct only grading errors that reduce your grade.
- Regrade requests will be accepted for **three weeks following the return of an assignment.**
- **Please do not submit regrade requests for one or two points total.** The exception is if we totaled up your points incorrectly: in that case, I will correct any size error.
- My intent is that you only lose points once for a mistake. Sometimes, an error in one part of an assignment creates incorrect answers in another part of the assignment. In that case, we look for internal consistency. If you believe that we inadvertently deducted points multiple times for the same error, please submit a regrade request explaining this.