

University of Pennsylvania  
The Wharton School

**Real Estate Finance: Investment and Analysis**  
**Fall 2022**  
**REAL/FNCE 2090**

*Updated August 15, 2022*

Professor James Vickery  
438 Vance Hall  
email: [vickeryj@wharton.upenn.edu](mailto:vickeryj@wharton.upenn.edu)

Office Hours: Thursday, 2:00-3:00 p.m.  
(drop in via Zoom) or 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. 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, this class does rely on a wide array of fundamental finance concepts, hence Finance 1000 is a prerequisite for enrollment.

**Course Materials:**

**Readings:** The required textbook is ***Real Estate Finance and Investments, Fifth Edition***, by Linneman and Kirsch. Used copies are okay – the syllabus lists page numbers for both the 5<sup>th</sup> and 4<sup>th</sup> editions. The Linneman text will serve you well through your career. Other readings are in the “Files>Readings” folder or on Study.net.

Required readings are listed in bold type on the syllabus.

For students interested in learning more, or having an different explanation of the same material, a good supplemental text is *Commercial Real Estate Analysis and Investments* by Geltner, Miller, Clayton and Eicholtz. 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 PDF format on Canvas 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 or download the most current version shortly before class. These slides are not designed to be a substitute for attending class.

**Financial Calculator:** You will need or a financial calculator to compute 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. Most students find it faster to use a simple financial calculator than to use Excel for these functions. Any calculator able to perform the above functions will do, such as the HP 10bii+. If possible, I will make calculators available for borrowing from the reserve desk at Lippincott Library.

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

- Class recordings
- Copies of the slides used in class (in PDF format)
- Sample Excel spreadsheets from the in-class examples
- Problem sets (both class prep 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:**

**Class Prep 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. Doing these problems is a fundamental part of learning the class material and are essential to prepare for the exams. Solutions are provided. I will neither ask you to hand in the problem sets nor grade them. They still are important. Please do the practice problems after the topic in which they are covered. (For example, do Practice Problems set #9 after we cover Topic #9.)

**Old exams:** Three years' worth of old exams will be available on Canvas. I encourage you to do these, timed and without looking at the solutions, in advance of the midterms.

### Cases:

There will be three 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 five members** and must work with the same team on all three cases. Your group may contain members from my class section, 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 collaborative process. **You are responsible for making your team work.** I suggest that students taking the class for a grade not be on a team with students taking the class pass/fail. 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 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.

You may discuss the cases with other groups in this class 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 on Canvas. Cases will be due in advance of being discussed in class so I can review them to prepare the class discussion. Any case that is turned in after the deadline but before the class discussion will incur a late penalty of 0.5% per hour. **Cases will not be accepted after the case discussion class starts.**

### Examinations:

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. I expect to hold the exams in-person unless circumstances require a virtual exam. If in-person, the exam will be closed-book and closed-note, though you will be allowed two pages of notes. You will also need to use

a financial calculator for calculations on an in-person exam.

- Monday, October 17
- Wednesday, December 7

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, but assumes proficiency in the basic skills taught in the first portion of the class.

**IMPORTANT: 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.* Makeups will be given only for medical or exceptional personal situations. To be eligible for a makeup, you need to notify me in advance of an exam if there is a chance you might miss it, unless in the case of a truly unforeseeable emergency.

**Attendance:**

Your presence and attention in class is critical to the collective classroom experience. Because of that, I grade attendance. You may have up to two unexcused absences without losing attendance credit. You don't need to provide an explanation for an unexcused absence. Excused absences also will not affect your attendance grade. You will also be given access to that day's class video. Please keep in mind that excused absences are given only for extenuating circumstances such as illness or family emergencies. Simply filling in a course absence report does not make an absence excused.

Walking into class late is disruptive and disrespectful to your fellow classmates and professor. Hence, I take attendance at the start of class and late arrivals (even a minute or two late) will be marked as absent.

**Grading:**

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

- Exams: 40 percent (20 percent each); you must pass each individually.
- Cases: 45 percent (15 percent each)
- 15 percent participation, attendance, and submission of "Class prep questions".
- You get a 0 for the class if you do not get a 100% on the "I read the syllabus" quiz on Canvas. I allow retakes until you get it right.

**Curve:** Generally, 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 often cannot be videotaped (so the guests feel comfortable speaking freely). You may need to get the notes from someone else if you are unable to attend. There will be three guest lectures this semester.

**Classroom Expectations:**

**Be on time:** I will start on time and end on time. Please do not arrive late; it is a distraction to me and others in the room.

**Be prepared:** Completed 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 bewildered.

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

**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 not all necessarily 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. 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.

**Office hours:** I hold regular drop-in office hours via Zoom on the link provided on Canvas. If you would like to reserve a specific time slot just for yourself or you and your case team, please email me and we'll schedule an appointment.

**TAs:** The course TA will hold office hours in advance of the cases and review sessions for the practice problems before the exams.

**Honor Code:**

It is your responsibility to make sure your entire team prepares the cases independently. Violations by any team member will result in the entire team failing the class. Here are the rules: You may verbally discuss the cases, including ideas, approaches, and solution methods, with other students who are currently enrolled in REAL/FNCE 2090. Each group must separately prepare their own case materials and write-ups without reference to anyone else's case materials or write-ups.

You may not obtain assistance, or solicit advice, from current students in MBA sections of this class, former UG or MBA students, current or past employees of firms involved with the cases, or anyone else involved in the real estate investment industry. You also may not provide such assistance or advice once you are no longer enrolled in this class. You may not share your written materials or Excel with anyone.

Violations of these rules will be treated as violations of Penn's Code of Academic Integrity. I do not distinguish between the plagiarizer – the team using other's materials – and the provider of the materials. Do not circulate your solutions to the cases. If I find your case to be the source of plagiarized material, I will report the violation and do my best to retroactively change your grade.

**Expectation of mutual respect statement:**

This class strives to be an inclusive community, learning from the many perspectives that come from having differing backgrounds and beliefs. As a community, we aim to be respectful to all. Faculty and students are expected to commit to creating an environment that facilitates inquiry and self-expression, while also demonstrating diligence in understanding others' viewpoints.

**Wellness statement:**

I am deeply aware of and sympathetic to the challenges that students may face both in and out of the classroom. Mental health concerns or stressful events (e.g., a global pandemic) may lead to diminished academic performance or reduce your ability to participate in daily activities. Free, accessible, confidential mental health services are available on campus (see the Counseling & Psychological Services (CAPS) website at <https://caps.wellness.upenn.edu/>). Students should also feel free to reach out to discuss any issues or request accommodations as necessary.

**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.

**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.

**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.

## Course Schedule

Required readings are in bold text. Textbook readings available as e-reserves at Lippincott Library are marked with an asterisk (\*). Other readings are optional.

Textbook page numbers are listed for both the 4<sup>th</sup> and 5<sup>th</sup> editions.

All “preparations” are required. Class Prep Questions are due at 6pm the day before class.

Date	Topic	Preparation/assignments	Readings
1. August 31	Topic #1: Course requirements, class overview, and overview of real estate markets		Linneman [4 <sup>th</sup> : chapter 2, pp.12-25; 5 <sup>th</sup> : chapter 2, 16-29.] “What Is Real Estate?”
September 5	<b>No class.</b>		
2. September 7	Topic #2: Valuation methods; pro-forma setup; NOI	Watch “Valuation methods” video on Canvas Take the “I read the syllabus” quiz on Canvas.	<b>Linneman [4<sup>th</sup>: chapter 4, pp. 43-55; 5<sup>th</sup>: chapter 5, pp. 55-69] “Property Level Pro Forma Analysis”</b> <b>Linneman [4<sup>th</sup>: chapter 5; 5<sup>th</sup>: chapter 6] “Financial Modeling”</b> Linneman, “Prerequisite I: The Basics of Discounted Cash Flow and Net Present Value Analyses” Linneman, “Prerequisite II: IRR: What It Is and What It Isn’t” Berk and DeMarzo, <i>Corporate Finance (Third Edition)</i> , chapter 4: “The Time Value of Money.”
3. September 12	Topic #2: Valuation methods, continued Topic #3: Leases	CP #1: Leases	<b>Linneman [4<sup>th</sup>: chapter 3; 5<sup>th</sup>: chapter 4] “The Fundamentals of Commercial Leases.”</b>
4. September 14	Topic #3: Leases, continued Topic #4: Cap rates	Watch “Cap rates” video on Canvas CP #2: Cap rates	<b>Linneman [4<sup>th</sup>: chapter 7; 5<sup>th</sup>: chapter 9] “The Use and Selection of Cap Rates”</b>
5. September 19	Topic #4: Cap rates, continued Topic #5: Creating or finding value in real estate investments		<b>BP: Linneman, “Forces Changing the Real Estate Industry Forever”</b>
6. September 19, 7 p.m. evening	<b>Guest lecture:</b> Olivia John, Osso Capital		

class			
7. September 21	Topic #5: Creating or finding value in real estate investments, continued <b>Case #1 handed out</b>		<b>BP: Martin, “Nine Abuses Common in Pro Forma Cash Flow Projections”</b> <b>Linneman [4<sup>th</sup>: chapter 8; 5<sup>th</sup>: chapter 18]</b> “Development Pro Forma Analysis.”
September 26	<b>No class.</b>		
8. September 28	Topic #6: Evaluating pro-formas; Property-level risk Topic #7: Mortgages; debt in the pro forma, risk of debt finance	CP #3: “Brooklyn Mixed-Use” mini-case Watch “Amortization” video on Canvas	Linneman, “Prerequisite III: Amortization Fundamentals”
9. October 3	Topic #7: Mortgages; debt in the pro forma, risk of debt finance, continued Topic #8: Taxes and Real Estate	CP #4: Refinancing	<b>Linneman [4<sup>th</sup>: chapter 4, pp. 55-56, 59-63; 5<sup>th</sup>: chapter 5, pp. 70-73, 75-83]</b> “Property Level Pro Forma Analysis” <b>Linneman [4<sup>th</sup>: chapter 16; 5<sup>th</sup>: chapter 18]</b> “Real Estate Exit Strategies.”
10. October 5	<b>Case #1 discussion</b>		
11. October 10	Topic #8: Taxes and Real Estate, continued <b>Midterm review sheet handed out</b>	CP #5: Getting to ATCF	
12. October 12	Topic #9: Financing real estate		<b>Linneman [4<sup>th</sup>: chapter 4, pp. 56-58; 5<sup>th</sup>: chapter 5, pp. 68-70]</b> “Property Level Pro Forma Analysis”, <b>Linneman [4<sup>th</sup>: chapter 13; 5<sup>th</sup>: chapter 15]</b> “The Use of Debt and Mortgages” <b>Linneman [4<sup>th</sup>: chapter 15; 5<sup>th</sup>: chapter 17]</b> “Ground Leases as a Source of Finance.” <b>Linneman [4<sup>th</sup>: chapter 17; 5<sup>th</sup>: chapter 19]</b> “Real Estate Private Equity Funds” <b>BP: Maira, “Understanding Real Estate Joint Ventures”</b> Linneman [4 <sup>th</sup> : chapter 11; 5 <sup>th</sup> : chapter 13] “Real Estate Bankruptcy Basics” Linneman, [4 <sup>th</sup> : chapter 12; 5 <sup>th</sup> : chapter 14] “Should You

			Borrow?"
13. October 17	<b>Midterm Exam 1 (covers material through October 12)</b>		
14. October 19	Topic #9: Financing real estate, continued		
15. October 24	Topic #10: Real estate market dynamics <b>Case #2 handed out</b>		<b>BP: Smith, "Adjustment Mechanisms in Real Estate Markets"</b> <b>Linneman [4<sup>th</sup>: chapter 20; 5<sup>th</sup>: chapter 25]</b> "Real Estate Cycles" Linneman [4 <sup>th</sup> : chapter 9; 5 <sup>th</sup> : chapter 11] "Development Feasibility Analysis"
16. October 26	Topic #10: Real estate market dynamics, continued		
17. October 26, 7 p.m. evening	<b>Guest lecture:</b> TBD		
18. October 31	<b>Case #2 discussion</b>		
19. November 2	Topic #11: Equity securitization and the REIT market		<b>BP: Harper, "Basic Valuation of a Real Estate Investment Trust"</b> <b>Linneman [4<sup>th</sup>: chapter 18; 5<sup>th</sup>: chapter 21]</b> "REITs and Liquid Real Estate" <b>BP: BofAML REIT Primer, 6<sup>th</sup> edition, pp. 1-7, 23-24</b> <b>BP: Zell, "Liquid Real Estate"</b>
20. November 7	Topic #11: Equity securitization and the REIT market, continued. <b>Case #3 handed out.</b>		<b>Linneman [4<sup>th</sup>: chapter 10; 5<sup>th</sup>: chapter 12]</b> "Real Estate Company Analysis." <b>BP: Steinfeld and Zisler, "UPREITs: A Vehicle for Tax Deferral and Asset Growth"</b> <b>BP: Winograd, "The Five Overlooked Features of the Real Estate Capital Markets"</b>
21. November 9	Topic #12: Securitization of Debt Interests: Commercial Mortgage-Backed Securities		<b>BP: Gordon, "How to Build a Bond"</b> <b>BP: Cibelli, "Lord Abbett Investment Brief, CMBS 2017"</b>

			Linneman [4 <sup>th</sup> : chapter 14; 5 <sup>th</sup> : chapter 16] “Sources of Long- and Short-term Debt”
22. November 14	Topic #12: Securitization of Debt Interests: Commercial Mortgage-Backed Securities, continued.	CP #6: CMBS	<b>BP: Chandan, “The Past, Present, and Future of CMBS”</b> <b>BP: Poindexter, “Defaults in Securitized Real Estate Loans”</b> <b>BP: DiSalvo and Johnston, “Skin in the Game in the CMBS Market”</b>
23. November 15, 7 p.m. evening	<b>Guest lecture:</b> Leo Huang, Ellington Management Group		
24. November 16	Topic #13: Corporate real estate		Linneman [4 <sup>th</sup> : chapter 19; 5 <sup>th</sup> : chapter 23] “Corporate Real Estate Decision Making”
November 21	<b>No class</b>		
25. November 28	Topic #14: Housing Markets		<b>BP: Sinai, “Safety in Renting”</b>
26. November 30	<b>Case #3 discussion</b>		
27. December 5	Topic #14: Housing Markets		
28. December 7	<b>Midterm Exam 2</b>		
December 12	<b>No class</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. Pick up your assignments promptly so you can check the grading and make sure that your grade on Canvas matches the grade on your assignment.

1) If we made an error in adding up your points to obtain your total score, all you need to do is *type* up a short explanation describing the points we failed to add, attach it to your assignment, and place both in my mailbox in Vance.

2) 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 your answer would have been correct had you not made your earlier mistake, we will note the mistake but not deduct further points for it. Similarly, if in a case you repeat the same calculation in a number of circumstances, we will deduct points only once for a calculation error but we will try to note it every time.

If you believe that we inadvertently deducted points multiple times for the same error, please *type* up a *detailed* explanation and submit it along with the assignment to my mailbox in Vance. Be sure to take the time to make sure you understand the errors you made before submitting the regrade request. Also, if an error is circled but no point deduction is noted, we did not take off points for it.

3) To aid your understanding of the material and of the grading philosophy, I typically provide an explanation of how the points were allocated. If you believe your grading was not consistent with the stated guidelines, please *type* up a *detailed* explanation and submit it along with the assignment to my mailbox in Vance. Be sure to take the time to make sure you understand the errors you made before submitting the regrade request. If not, you run the risk that you actually did worse than you thought and were too generous with the points given. In addition, under no circumstances will I consider regrade requests that allege that the grading guidelines are unfair. The guidelines are applied equally to everyone, thus are equitable. Rather, the regrade request is intended to correct errors in adhering to the rubric.

4) If you merely would like an explanation of the grading on an assignment, submit your assignment with a typed cover letter letting me know what you would like me to explain. We will set up a time to meet and I will explain it to you. Under no circumstances will I go over the grading of your assignment in “real time,” with no forewarning.

#### *General policies:*

- 1) I personally do all the regrades, in conference with the graders.
- 2) If you request a regrade, the entire assignment will be reviewed. Errors tend to be random

and offset each other. It would be unfair to the rest of the class to correct only the grading errors that went against you but not the ones in your favor.

- 3) Regrade requests will be accepted for *three weeks* following the *return* of an assignment. If an assignment has multiple parts, the deadline for a regrade request for *any* part of the assignment is three weeks after the return of the *last* part of the assignment.
- 4) The acceptable margin of error on a 100-point assignment is +/- 2 points. 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.
- 5) Do not submit regrade requests by email.