

Venture Capital and the Finance of Innovation

FNCE 750

Fall 2020

Green highlight indicates a change made after first day of class

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Canvas site: <https://canvas.upenn.edu/courses/1541211>

Lectures: Monday/Wednesday on Zoom

[Note all times in this course are in the Eastern time zone.]

Section 1: 12-1:20pm

Section 2: 1:30-2:50pm

Section 3: 3:00-4:20pm

Link: Canvas site → Click on Zoom → Click on “FNCE 750 - Lectures”

Office hours with professor:

Fridays, 9-11am

Link: Canvas site → Click on Zoom → Click on “FNCE 750 - Prof. Office Hours”

If you prefer a private meeting or different time, email me to schedule a Zoom call

Office hours with TAs:

Tuesdays, 2:15-3:45pm

Link: Canvas site → Click on Zoom → Click on “FNCE 750 - TA Office Hours”

VIRTUAL FORMAT

The course will be completely virtual, with no in-person contact. Roughly 80% of lecture material will be delivered live on Zoom (i.e., synchronously). The remaining 20% will be delivered via pre-recorded video (i.e., asynchronously). Many more details on the virtual format below.

PREREQUISITES

FNCE 611 (or 612) and 613 are both prerequisites. FNCE 613 may be taken concurrently with FNCE 750.

SUMMARY

The course covers the finance of technological innovation, with an emphasis on the quantitative methods useful for venture capital investing. This is first and foremost a finance course, so we will not cover the management, strategy, legal, marketing, and other non-financial topics that are also important in VC investing. The primary audience for this course is finance majors interested

in careers in venture capital, entrepreneurship, or R&D-intensive companies (e.g., tech, pharma). There are five quizzes and one team project with four deliverables throughout the semester.

GOALS FOR THIS COURSE

The course's goals, from most to least important, are

1. Help students gain a deeper understanding of finance.
2. Provide a framework for making investment decisions about high-technology projects.
3. Provide students with institutional background, specialized vocabulary, and important facts about the venture capital industry.
4. Expose students to several promising new companies.

GETTING HELP / TEACHING ASSISTANTS

Our TAs for the semester are Kelder Arellano, Anna Helmke, Reynaldo Kirton, and Lou Stokum. Anna is a finance PhD student. The other TAs are 2nd-year MBA students. There are several ways you can get help with questions throughout the semester:

1. Ask me (Luke) in weekly office hours
Fridays, 9-11am
Link: Canvas site → Click on Zoom → Click on “FNCE 750 – Prof. Office Hours”
2. Ask our TAs in their weekly office hours
Tuesdays, 2:15-3:45pm
Link: Canvas site → Click on Zoom → Click on “FNCE 750 – TA Office Hours”
3. Email us:
 - Luke: luket@wharton.upenn.edu
 - Kelder: kelder@wharton.upenn.edu
 - Anna: ahelmke@wharton.upenn.edu
 - Reynaldo: rkirton@wharton.upenn.edu
 - Lou: stokum@wharton.upenn.edu

The TAs and I promise replies to emails within 24 hours on weekdays. We cannot promise replies to emails sent less than 24 hours before due dates or quizzes.

HOW DOES THE COURSE COMPARE TO OTHERS?

The course complements several entrepreneurship courses offered in various Wharton departments. The most closely related course is MGMT 804, Venture Capital and Entrepreneurial Management. There will be some overlapping materials in the first half of the course, when we learn the basics of the VC industry, but virtually no overlap in the second half, when we build on the basics. To learn more about the differences between these courses, go to Canvas → Files → Miscellaneous → “Comparing FNCE 750 and MGMT 804.pdf.”

READINGS

- **Priority:** Each week I'll email you the upcoming week's readings, and I will also tell you the priority of each reading.
- **Primary textbooks (both optional):**
 - *Venture Capital & the Finance of Innovation, 2nd Edition*, by Andrew Metrick and Ayako Yasuda.
 - *Venture Deals, 4th Edition*, by Brad Feld and Jason MendelsonBoth textbooks are excellent and worth buying. Metrick and Yasuda's is more academic, Feld and Mendelson's is more practical. I am making both optional because we will use only small portions of each textbook. Both can be purchased online and in the university bookstore.
- **Cases:** There will be approximately four cases. Some will be on the course website, some will be on Study.net.
- **Other required readings:** I'll occasionally send you articles from academic journals, newspapers, etc. We'll sometimes discuss them in class, and they may appear on the quizzes.
- **Piazza.** If you find a newspaper article, blog post, etc. you think your classmates or I may like, post it to Piazza via our Canvas site. You can find the Piazza tab on the far left column of our Canvas site. Post these readings in the folder "interesting_readings." I'll also be posting interesting articles I find. Check out and comment on readings your peers have posted. This Piazza board will be a nice way to keep up with industry trends and see more real-world examples. These readings are optional, but posting and commenting on Piazza can help your participation grade. More on Piazza below.
- **Review questions and solutions:** Details on these below.
- **Solutions to textbook exercises:** Posted on Canvas in folder "Exercises from the textbook."

GRADING

There are three components to the course grade, for a total of 100 points:

- Team project (45 points). Four deliverables:
 - Sourcing the deal (5 points, due Oct. 19th)
 - Valuing the company (20 points, due Nov. 9th)
 - In-class presentation (5 points, Dec. 2nd, 7th, or 9th)
 - Partial valuation, term sheet, and negotiation strategy (15 points, due Dec. 15th)
- Five quizzes for a total of 45 points. I will drop your lowest score out of the five.
- Participation (10 points)

A few notes on grading:

- **Quizzes**
 - Quizzes cover lectures, study questions, and readings.

- Each quiz covers material since the previous quiz, so they're not cumulative.
- You will take quizzes remotely using Canvas.
- Most questions will be multiple choice.
- You will have 25 minutes to finish each quiz once you start it. You will be able to start each quiz at any time of your choosing during the 24-hour window that makes up the quiz day.
- Quizzes are open book, open note, and open Internet. You are not allowed, however, to collaborate with anyone on the quizzes. Aiding or receiving aid from someone on a quiz will result in a failing grade for the course and a referral to the Dean of Student Conduct. I will be using a variety of tools to check for cheating on the quizzes.
- **Missing quizzes.** Since I drop your lowest quiz grade, it's no problem to miss one quiz for any reason, including a job interview, travel, bad hair day, etc. For that same reason, I will not offer make-up quizzes except in the event of grave illness or family emergency. In that event, contact the MBA program office before the quiz day, ask for their guidance, and have the MBA office contact me before the quiz day. You should plan on taking all five quizzes. Don't plan to miss one quiz and then unexpectedly have to miss a second quiz, as this will really hurt your course grade.
- The quizzes and projects may cover **material from outside of lectures**. I do this because we don't have enough time in lecture to cover everything you need to learn, and I have faith in your ability to learn some material on your own. Of course, the TAs and I are here to help you if you get stuck on this additional material.
- Your **participation grade** depends on both the quantity and quality of participation. I realize that **time-zone differences** will make it hard for some students to participate, so I am making participation only 10% of the course grade. You can obviously participate during live lectures, but there are also ways to participate outside lectures:
 - Post good readings and comments on our course Piazza page (details above).
 - Participate in normally scheduled office hours or, if that time slot doesn't work for you, set up meetings with me at a time of your choosing (email me).
 - Participate in student lunches and cocktail hours (details below).
 For students in far-away time zones, I will put more weight on these ways of participating outside lectures. If you are still concerned about your ability to earn a participation grade due to a time-zone difference, please email me and we will try to find some creative solutions.
- **Re-grade policy:** You have one week from the date on which the assignment or quiz is graded to email me a written appeal. We will then re-grade the entire assignment/quiz, and as a result your score may go up or down.
- **Cheating.** By enrolling in this course, you are explicitly agreeing to abide by the Student Code of Conduct. If there is any doubt as to whether or not your actions constitute cheating, please ask me.

TEAM PROJECT

- The semester-long **team project** integrates the course material and asks you to apply it to a VC investment scenario. Your team will take on the role of VCs evaluating a hypothetical investment in a real company of your choosing. You can find a detailed description of the

project on Canvas → Files → Project. Here is an overview of the four deliverables, which are spaced throughout the semester:

- **Sourcing the deal** (5 points): Find a company to analyze and submit a short memo describing the company and investment opportunity. The main requirements are that the company be privately owned (i.e., pre-IPO), less than 15 years old, and in the typical industries VC invest in. Most importantly, your team should choose a company that you're excited to learn about. Unfortunately, data availability will severely limit your choice of company.
- **Total valuation** (20 points): Perform a detailed DCF valuation of the company, including an in-depth analysis of addressable market size and comparables.
- **In-class presentation** (5 points): Each team will give a short in-class presentation on the company and your team's valuation. These will happen on Zoom at the end of the semester. You are expected to present during normal class time even if you are in a far-away time zone.
- **Partial valuation, term sheet, and negotiation strategy** (15 points). Write a term sheet that describes the terms of the deal, including security type, number of shares, amount invested, and protective covenants. You will also write an internal memo to the senior VC partners describing your negotiation strategy.
- **Teams** ideally will have four members. Three is also OK. I may allow teams of five if there is a compelling reason (ask me). I want teams to be large for three reasons: this project requires a lot of work, I want every team to have a chance to present in front of the whole class, and I want to provide each team quality feedback. All members of the team will receive the same grade. Switching teams mid-semester is not allowed.
- Avoid “**differently motivated**” teammates. It can be frustrating when a teammate doesn't do their fair share of the work. Make sure your teammates are as motivated as you are. Ask potential teammates whether they are taking the course pass/fail and how hard they plan to work on the project.
- You can find **examples of successful projects from previous years** on Canvas → Files → Project → Examples of good past projects.

DETAILS ON THE VIRTUAL COURSE FORMAT

- I want there to be as much interaction as possible between you and me, and also between you and your classmates. We all miss those interactions terribly these days. Also, I realize it's hard to pay attention on Zoom. We'll try to solve these problems in a number of ways:
 - **Please never mute your video in Zoom**, bandwidth permitting.
 - **Please speak during Zoom sessions**. Don't be shy! There are a few ways to do this. From most to least favorite:
 - Click “Raise your Hand” in Zoom, then I'll call on you to speak. Your video + audio is so much more interesting than seeing a question typed in the chat box.
 - In Zoom's chat area, type a comment and ...
 - ... post it to everyone
 - ... post it privately to me
 - Even more than usual, I'll be doing less lecturing and more interactive discussions and example questions.

- We'll do as many break-out groups and live polls as possible during lectures.
- I hope to do **no cold-calling**. If there isn't enough participation, though, I will start cold-calling, and I will have to require students to attend their official section.
- I'll host several **Zoom lunches and nightcap sessions** with small groups of students. These are designed to replace the old lunches at Pod, White Dog, etc. I hope the late-night session will be convenient for students in distant time zones. More details on this later.
- All classes will be videotaped and posted on Canvas.
- I won't take attendance, but attending our Zoom sessions will help your participation grade (not to mention your learning).
- If you need to attend a section different than the one you're officially signed up for, you're welcome to do that, and you don't need to ask my permission.

HOW TO GET THE MOST OUT OF THE COURSE (AND GET A GOOD GRADE)

From most to least important:

- Study the content and examples from lectures.
- Do the required readings before each lecture. This is especially true for cases and articles that we plan on discussing in class. Take notes on all the required readings, and study those notes before the quizzes. I expect you to remember the main points from the readings, but I don't expect you to memorize details.
- Find good teammates, and put in lots of hours on the group project. Look at the sample projects from last year to see what I'm looking for.
- Do the **review questions**. For most lectures I will post review questions and their solutions (Canvas website → "Review Questions"). These are not turned in or graded. Working on these questions is an excellent way to prepare for the quizzes. I strongly encourage you to work through the questions before consulting the solution. The review questions introduce some material that we did not cover in lecture. I expect you to learn this material on your own. On the bright side, you'll have the solutions, and the TAs and I are here to help if you need it.

COURSE SCHEDULE AND TOPICS

The schedule below is approximate, except for quiz dates. Some topics will take longer than one lecture, others shorter. Certain topics and guest speakers may be added or deleted. Every week I'll send you an email describing exactly how to prepare for the following week.

Some guest lectures will happen live in just one of my sections rather than all three. The reason is that I could not convince some guests to visit all three of my sections. I encourage everyone to switch sections on these days so you can see the guest speaker live. I apologize – and do not blame you at all – if a scheduling conflict prevents you from switching sections on these days so you can see the guest live. All guest speakers will be videotaped, so even if you cannot attend the live session, you will be able to watch the video afterwards.

In the schedule below, VCFI refers to *Venture Capital and the Finance of Innovation*, and VD refers to *Venture Deals*. I will post additional required readings throughout the semester.

| Date | Topic | Readings (chapter) | Quizzes |
|---------|--|----------------------------------|---------|
| Sep. 2 | Introduction | Syllabus | |
| Sep. 7 | No class (Labor Day) | | |
| Sep. 9 | The VC industry | VCFI (1), VD (1) | |
| Sep. 14 | VC, innovation, and COVID-19 | | |
| Sep. 16 | Structure of VC firms and funds | VCFI (2), VD (12), case TBD | |
| Sep. 21 | VC fund performance | VCFI (3) | |
| Sep. 23 | The risk-reward tradeoff in VC | VCFI (7.1, 4) | |
| Sep. 28 | VC investment process and due diligence | VCFI (7.2), VD (3), case TBD | |
| Sep. 30 | Guest speaker: Erik Hirsch from Hamilton Lane | | Quiz #1 |
| Oct. 5 | Term sheets | VCFI (8), VD (4, 6, 7), case TBD | |
| Oct. 7 | Preferred stock | VCFI (9.1), VD (5) | |
| Oct. 12 | Dilution and anti-dilution protection | VCFI (9.2) | |
| Oct. 14 | Buffer for spillover | | Quiz #2 |
| Oct. 19 | Evaluating high-growth opportunities | VCFI (10) | |
| Oct. 21 | An analysis of Atricure | | |
| Oct. 26 | Valuation by DCF | <i>Valuation</i> (36) | |
| Oct. 28 | Valuation using multiples | VCFI (12) | |
| Nov. 2 | Options in VC | VCFI (13, 16.1) | |
| Nov. 4 | Guest speaker: Josh Kopelman from First Round Capital | | Quiz #3 |
| Nov. 9 | Valuing preferred stock: Series A | VCFI (14) | |
| Nov. 11 | Guest speaker: Vas Natarajan from Accel Partners | | |
| Nov. 16 | Valuing preferred stock: Later rounds | VCFI (15, 17) | Quiz #4 |
| Nov. 18 | Guest speaker: Iris Choi from Floodgate | | |
| Nov. 23 | Angel financing structures | VD (8, 9) | |
| Nov. 25 | No class (day before Thanksgiving) | | |
| Nov. 30 | Guest speaker: TBD | | |
| Dec. 2 | Team presentations + last quiz | | Quiz #5 |
| Dec. 7 | Team presentations | | |
| Dec. 9 | Team presentations + semester wrap-up | | |