

**Venture Capital and the Finance of Innovation**

Spring 2008  
M/W 1:30pm  
[ TBA ]

FNCE 250  
Section 1

Professor  
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Office hours: Mondays 3:30-5:00, and by appointment. Please email suggested times.  
Questions can be asked via email as well.

**OBJECTIVES**

This course examines VC finance and the related practice of R&D finance. The aim of the course is to apply finance tools and concepts to the world of venture capital and financing of projects in high-growth industries. Students will be introduced to all the institutional aspects of the venture capital industry, but the course is *not* a survey course. Rather, it is structured as a finance course and we will analyze various aspects of VC finance and R&D finance using an investor's perspective (as opposed to an entrepreneur's). The ideal audience for the course is upper-class undergraduates interested in both VC *and* finance. For those of you, the course offers a lot of interesting applications of all major finance tools --- from discounted cash flows to option-pricing models to Monte Carlo simulations. If you are looking for a qualitative survey course of the VC industry, on the other hand, you will likely be frustrated (if not exasperated!) with the level of quantitative work involved. That said, the course requires nothing more than the 1<sup>st</sup>-year core courses as prerequisites.

In particular, we will explore the following four major questions:

1. How do VCs organize and manage their funds? (VCs as funds)
2. How do VCs evaluate prospective portfolio companies? (Total valuation module)
3. How do VCs evaluate their stakes in the portfolio companies and how do terms of investments affect them? (Partial valuation module)
4. How do tech companies evaluate R&D investments? (R&D finance module)

Each question is explored in 6 consecutive classes. After 12 classes, we will have a quiz. After 6 more classes, we will have another quiz. After the last 6 classes, we will have a final exam covering the entire class.

**HOW USEFUL IS THIS?**

Some students may wonder how useful rigorous finance (i.e., financial modeling and spreadsheet calculations) is in the world of venture capital. They may also be interested in a more practitioner-oriented course about "how to" become a venture capitalist. Such a course would certainly be very valuable, and this course will make no claim that it offers more value than such a course.

Instead, it intends to differentiate itself by taking a critical look at the existing practice of VC finance and offering a coherent framework in which to assess risk and evaluate investments. Recall that use of the Black-Scholes formula to evaluate executive compensation has become main-stream practice only in the last several years, and that many industry insiders were initially vehemently against adopting the new technique (for not very good reasons, it turned out). Only time will tell, but conversations with industry participants I have had through my research suggests that similar transformation of VC practice not only makes a lot of sense but also is increasingly likely, as investors (LPs) grow more sophisticated and less wide-eyed, and venture capitalists (GPs) eagerly search for a new paradigm.

In addition, I've been told by previous years' students that the investor's perspective taken throughout the course is actually quite valuable to those pursuing careers in entrepreneurship (remember, "*Know thy enemy and you will not fear the outcomes of hundred battles*"), as well as those interested in investment banking, consulting, or corporate law careers.

#### **HOW DOES THE COURSE COMPARE TO OTHERS?**

The course will complement entrepreneurship finance courses offered by the management department. There will be some overlapped materials in the first half (where we learn the basics of the venture capital industry), but virtually no overlap in the second half of the semester (where we build on the basics).

#### **READINGS**

The required primary text for the course is *Venture Capital & the Finance of Innovation (VCFI)* (John Wiley and Sons) which is available in the bookstore.<sup>1</sup> The Bulk Pack containing case readings is available at Reprographics. The cost of handouts distributed in class will be billed at the end of the semester. All materials handed out in class will also be made available electronically on Webcafe during the course (except, of course, for copyrighted readings.)

#### **EVALUATION**

There will be two quizzes counting for 15% each (for a total of 30%) and one final exam counting for 45% of the course grade. The final exam will cover the entire course. For students who show an exceptional improvement in performance in the final exam compared to the average of the two quizzes (either an increase of at least 20 percentiles in rankings or 20% in scores) the weights will be changed to 15% total for the quizzes and 60% for the final. Students may use one double-sided page of notes for the quizzes and two double-sided pages of notes for the final exam. There will also be 5 assignments counting for 25% of the course grade.

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<sup>1</sup> The book is its first edition and there are some typographic errors that the editor missed. The list of corrections (as of 01/07) is available in "Textbook" folder of Webcafe.

To determine the final grade distribution, a numerical weighted average of the four components will be computed. The faculty's recommended grade distribution is used as a guideline, and will be adjusted up or down depending on overall class performance.

Attendance is very important for this class because there will be a lot of diagramming exercises (of VC exit values), especially in the second half of the course. We will do this in class in real time, which is the best way to learn how to think visually. It is a lot of fun, and it is something that you have not done in other classes. So, if you must miss classes, choose wisely. The best classes to miss are in the first half (class 1-12), when things are easier to catch up. The worst classes to miss are in the second half, when things become more advanced, and are harder to catch up on your own.

While attendance and class participation is not explicitly counted, it will be taken into account for students whose weighted average falls near a boundary of a grade cutoff. If medical problems force you to miss an examination, please contact me ***before*** the exam.

#### CLASSROOM STANDARDS

For coming late and leaving early for legitimate reasons, special seats near the classroom doors will be reserved. Please email me in advance for date/section/reasons, and take one of those reserved seats. Please be respectful of other students and minimize disruption when you come in/leave.

#### TEACHING ASSISTANTS

[ TBA ]

The TAs' office hours will be uploaded to the Webcafe calendar in the next week.

#### STUDY TEAMS

Homework assignments can be done individually or in teams of up to two (but no more than two) students. Students may form teams across sections. MBA students and undergraduate students may not be on the same team. Working in teams is strongly encouraged but is not compulsory. If students work as a team, both members of the team will receive the same grade. Students working in teams are responsible for printing names of both students on the cover page of assignments. Here is an important message from the Webcafe Tech team: You are welcome to use the project folder feature of Webcafe, but please follow the security instructions and make sure that no students other than you and your teammate can access the folders you create. Otherwise, ***any updates to your work will not only be public but also will be notified to the whole class in nightly email notifications.***

#### ASSIGNMENTS

Each homework assignment will be evaluated on a 10-point scale. They will be used as learning tools for vocabulary and for solving models. For questions requiring calculations, please explicitly write out and explain your calculations in your write-

ups whenever possible. Doing this, rather than merely copying the final numbers from your spreadsheets, has two benefits. First, it will help you prepare for examinations, when you will need to rely only on calculators. Second, it will help us understand what you did and give you credit accordingly. In completing the assignments, students may not use any materials from previous offerings of the course.

### VIDEOTAPING SESSIONS

Exam review sessions and guest speaker lecture(s) will be videotaped and made available on Wharton Video Network. In addition, the class sessions that coincide with religious holidays (Apr. 2-3) will also be videotaped in accordance with the University policy.

### COURSE SCHEDULE , READINGS AND DUE DATES

Please note that the schedule is approximate; some chapters will take longer than a lesson and others will take a shorter time. If anybody has a problem meeting a due date because of religious holiday, please let me know as soon as possible. Extensions will be granted in such cases. VCFI refers to the textbook *Venture Capital and the Finance of Innovation*. In addition, some handouts will be given out as supplemental readings in class.

Wed	Jan. 16	Introduction	VCFI Ch. 1
Mon	Jan. 21	NO CLASS <sup>2</sup> (Martin Luther King, Jr. Holiday)	None
Wed	Jan. 23	Who are the VC players?	VCFI Ch. 2
Mon	Jan. 28	Returns to VC Investments	VCFI Ch. 3
Wed	Jan. 30	The Cost of Capital in VC	VCFI Ch. 4
Mon	Feb. 4	The Best VCs	VCFI Ch. 5
Wed	Feb. 6	VC Around the World	VCFI Ch. 6
			Accel case
			<b>HW 1 due</b>
Mon	Feb. 11	VC Investments	VCFI Ch. 7
Wed	Feb. 13	Term Sheets	VCFI Ch. 8
			Walnut case
Mon	Feb. 18	Preferred Stock	VCFI Ch. 9

<sup>2</sup> This course is synchronized with an undergraduate course (FNCE250) meeting on Mondays and Wednesdays. In honor of Martin Luther King, Jr. Holiday, there is no class on January 15 (Monday), and, subsequently, we will not meet on January 16 (Tuesday).

Wed	Feb. 20	The VC Method	VCFI Ch. 10
Mon	Feb. 25	DCF analysis of Growth Companies	VCFI Ch. 11
	TBA	Speaker	
Wed	Feb. 27	Comparables	VCFI Ch. 12
Mon	Mar. 3	Review Session	<b>HW 2 due</b>
Wed	Mar. 5	Quiz 1 (covering ch. 1-12)	None
	Mar. 10- Mar. 14	Spring break	
Mon	Mar. 17	Option Pricing	VCFI Ch. 13
Wed	Mar. 19	The Valuation of Preferred Stock\	VCFI Ch. 14
Mon	Mar. 24	Later-Round Investments	VCFI Ch. 15
Wed	Mar. 26	Participating Convertible Preferred	VCFI Ch. 16 Metapath case Securicor case
Mon	Mar. 31	Implied Valuation	VCFI Ch. 17 Walnut case <b>HW 3 due</b>
Wed	Apr. 2	Complex Structures	VCFI Ch. 18
Mon	Apr. 7	Presentation / review session	<b>HW 4 due</b>
Wed	Apr. 9	Quiz 2 (covering ch. 13-18)	None
Mon	Apr. 14	R&D Finance	VCFI Ch. 19
Wed	Apr. 16	Monte Carlo Simulation	VCFI Ch. 20
	TBA	Crystal Ball simulation tutorial	
Mon	Apr. 21	Real Options	VCFI Ch. 21
Wed	Apr. 23	Binomial Trees	VCFI Ch. 22
Mon	Apr. 28	R&D Valuations / Wrap-up lecture	VCFI Ch. 24
Fri	May 2	<b>HW 5 due</b> by 5pm at reception desk of Finance Dept.	

TBA		Review session
[ ]	May [ ]	Final exam (covering the entire semester)
[TBA]		