BUSI 448: INVESTMENTS
SPRING 2023
This version: December 19, 2022

Class Time:	Tues/Thur, 9:25-10:40 am (McNair 318)
Professor:	Kevin Crotty
E-mail:	**kevin.p.crotty@rice.edu**
Office:	McNair Hall 341
Office Hours:	Wednesday 3-4 pm. I am happy to deal with most questions and issues via email, though some things might require a face-to-face meeting. You can contact me for alternate times, but be aware my spring schedule is fairly crowded.
My Webpage:	https://kpcrotty.github.io/
Program Specialist:	Crystal Gant, cggant@rice.edu, 713-348-3730, McNair 319

Course Requirements and Prerequisites:
Students must have successfully completed **introductory finance** (BUSI 343 or ECON 343) and a **statistics** course (e.g., BUSI 395, STAT 310, STAT 315). This course assumes familiarity with the material covered in those courses. I will also assume familiarity with concepts from **calculus.**

Course Objectives:
This course provides an overview of financial asset classes, including equity and fixed income securities, and how they are traded. Students will develop a theoretical and practical understanding of modern portfolio theory, with an emphasis on measuring and managing investment risk and return. The course will cover asset pricing models and their role in understanding risk and return. We will also consider how to evaluate performance of professional asset managers and the role of taxes in investment performance.

Throughout the course, we will have one eye on theory and one on practical implementation. The goal is for each student to develop a fairly robust understanding of the theory of risk and return and to be exposed to a core set of analytical portfolio management tools. By the end of the course, each student should have an understanding of the historical risk and return behavior of major asset classes and a foundational understanding of investment management practices.

Software:
Demonstrations of the course material will be conducted using Python. **I will assume you have zero Python experience.** You do not need to install Python on your machine (although you are welcome to do so). We will work together in Jupyter notebooks in the cloud at the course's code binder website.

In theory, you could complete the course using other software, including Excel or R. Assignments will be run through Canvas, and I am somewhat agnostic about the software used to arrive at the answer. However, I **strongly encourage** you to use Python for a few reasons. First, I will be able to assist you more readily if you come to me with questions in Python. Second, Python is an extremely useful asset to have in your portfolio. Third, the course materials are in Python, so it will likelier be easier to adapt them than starting from scratch in a different software.

Textbooks:
My colleagues (Kerry Back, Barbara Bennett, and Yuhang Xing) and I are writing a bespoke textbook **Modern Investments: Theory, Data, and Practice** for this and other courses we teach. A working version of the textbook is available at http://mi.bbcx-investments.com/. We have built a companion website that demonstrates a number of investments concepts. We will use the website occasionally throughout the course, and it may be useful for some problem sets.

Our book is truly a work-in-progress, so I am also providing recommended readings from the standard MBA investments text, **Investments** (12th edition) by Bodie, Kane, and Marcus. BKM are currently on their 12th edition, but recent earlier editions would also be fine as a reference if you want a cheaper used copy.

One big difference between the texts above is that BKM provides Excel examples throughout the text while BBCX provides Python implementations.

A good general Python reference is **Python for Data Analysis** by Wes McKinney. A free version is available at https://wesmckinney.com/book/. You can also order a print copy if you are like me and enjoy having a hard-copy book.

Grading:
Final grades will be determined using the weighting scheme below. Grades are assigned following the BUSI grading policy: the class mean GPA is capped at 3.5.

Assessment	Weight
Problem Sets (Best 10 of 11 scores)	50%
Midterm	20%
Final	30%

Problem Sets:
Each week, there will be a problem set administered through Canvas. The objective of the problem sets is to ensure that you are spending some time thinking about the material we cover. Note that I will drop your lowest problem set grade in calculating the overall grade. This is designed to be a free hedge against busy weeks in your semester, idiosyncratic personal events, etc. As a result, I will generally not accept late problem sets for credit unless I have granted permission well prior to the due date. Any accepted late assignments are usually assessed a deduction to be fair to other students.

Midterm
The cumulative midterm exam will be a take-home on-line exam administered through Canvas. It will be a timed assignment made available sometime in the week prior to its due date. The midterms are generally not cumulative in the sense that they will focus on the most recent material. I will be clarify the material to be tested in class. You may use the BBCX website, the course binder, Python, Excel, or R to work the problems.

Final:
The cumulative final exam will be an **in-class exam.** It will be administered through Canvas. You may use the BBCX website, the course binder, Python, Excel, or R to work the problems. More details will be provided in class. **Please do not schedule travel or other conflicts until you know the date of the exam.**

Course Schedule

Class #	Date	Topic	Suggested Reading	Deliverable
1	Jan 10	**Introduction** Course intro + Bond pricing	BBCX Appendix BKM 14	
2	Jan 12	Saving for retirement	BBCX 1	
3	Jan 17	Calculating returns Fetching data	BKM 5	PS 1
4	Jan 19	**Financial Markets** Equity Markets	BKM 2,4	
5	Jan 24	Fixed Income Markets		PS 2
6	Jan 26	Arbitrage + No-arbitrage pricing		
7	Jan 31	Markets, Trading, + Adverse Selection	BKM 3	PS 3
8	Feb 2	Leverage + Margin		
9	Feb 7	Short-selling + Limits to arbitrage		PS 4
	Feb 9	*SPRING RECESS – NO CLASS*		
10	Feb 14	**Optimal Portfolios** Diversification	BBCX 2 BKM 6	PS 5
11	Feb 16	Portfolios: Theory	BBCX 3 BKM 5	
12	Feb 21	Portfolios: Practice	BBCX 4	Midterm
13	Feb 23	Rebalancing	BBCX 5	
14	Feb 28	Input Sensitivity	BBCX 6	PS 6
15	Mar 2	**Equity Topics** Benchmark models	BKM 8	
16	Mar 7	CAPM	BKM 9	PS 7
17	Mar 9	Return predictability + anomalies	BKM 13	
		SPRING BREAK		

18	Mar 21	Multi-factor models	BKM 10	
19	Mar 23	**Fixed Income Topics** Duration	BKM 16	
20	Mar 28	Convexity		PS 8
21	Mar 30	Credit Risk		
22	Apr 4	**Taxes** Tax-advantaged accounts		PS 9
23	Apr 6	Tax-advantaged assets		
24	Apr 11	**Performance Evaluation** Asset mgt equilibrium + agency issues	BKM 24	PS 10
25	Apr 13	Returns-based measures		
26	Apr 18	Fees + Performance		PS 11
27	Apr 20	Catch-up + Review		
	TBD	*FINAL EXAM*		

Other Policies, Expectations, and Information:

- *Special needs*: If you have any special needs (including observances of religious holidays, etc.) or a documented disability for which you need accommodation, please let me know privately right away.

- *Laptop policy and phone policy*: The Jones School's policy is that laptops should remain closed except when instructed otherwise. We will use the course binder to run Python and the BBCX investments website in course, so please make sure you have a laptop (or tablet with keyboard) that will allow you to access those sites. Please silence your cell phone during class.

- *Name tents:* I will distribute name tents for you to display during class. Please bring and display them each class to facilitate our discussions in class. Hopefully, I won't need them by the end of the semester, but my track record confusing my children's names suggests otherwise.

- *Academic honesty*: The Rice University Honor Code applies to all work in this course. The intent of the Honor Code in general and specifically in this course is to ensure that each student claims and receives credit for their own efforts. The intent is not to limit the valuable exchange of ideas through *discussion* among fellow students. The atmosphere at Rice University and the Jones School must be one of academic and personal integrity. Any suspected violations of the Honor Code are submitted to the Rice University Honor Council. Use of solution materials from other sections of this course or solutions found online are violations of the Honor Code. **If you have any questions about what is or is not allowed, please ask me.**