Fin 410 – Investments
Course Syllabus
Fall 2015

Course Information:

Instructor:	Rob Schonlau, PhD
Class schedule:	Monday and Wednesday (Section 1: 8:00 – 9:15am; Section 2: 11:00 – 12:15 pm; Section 3: 3:30 – 4:45pm)
Location:	W242 TNRB, W118 TNRB, and W118 TNRB

Instructor Information:

My office hours:	T,TH 9:30 – 10:30am and by appointment	
My contact info:	Office:	TNRB 682
	Telephone:	801-422-5879
	Email:	robert.schonlau@byu.edu

TA Information:

TAs:	Tanner Stutz	(tannerstutz3@gmail.com)
	Scott Holmes	(scott.holmes33@gmail.cm)
	Jon Brookes	(jbrooks@byu.net)

TA office hours: To be announced the first week of class. The hours and locations will also be posted on Learning Suite as soon as the times and locations are finalized.

Course Objectives:

This course is designed to strengthen and extend your understanding of the financial theory related to investments. The theory will be discussed during the lectures and via assigned readings. Applications of the theory will be provided via cases, a stock trading simulation project, and a series of homework assignments. During the course we will learn about debt and equity securities, financial markets, quantitative tools used to analyze investments, several models for the relation between risk and expected returns, and portfolio theory.

The types of questions addressed in this course include: What are common debt and equity securities that people invest in? Where and how do people invest in these securities? How do you create a portfolio that maximizes return for a given level of risk? What quantitative tools and measures do investors use to compare different investments? How do you calculate these measures? What is the relation between risk and return? How do you measure risk? How do you create an "efficient" portfolio in terms of risk and return? How do you select a benchmark portfolio to evaluate your portfolio's performance?

We will also spend some time discussing mutual funds, hedging, bond duration, and equity valuation. The goal for this course is to provide you with a good foundational overview of the terminology, calculations, and theory behind investments.

Required Material:

- *Essentials of Investments*, Bodie, Kane, and Marcus, 9th Edition
- A calculator that can be used for exams.
- Access to a computer with Excel. In Excel you need to be able to estimate regressions. For Windows users this can be done using the "analysis toolpak". There are similar add-ons for Macs.

Suggestions for Success in Fin 410:

1. **Attend the lectures** on Monday and Wednesday. **Download and/or print the lecture slides** before class and use them to take notes.
2. **Read the assigned reading** from the textbook. It is best to try to read it prior to coming to class but if not before then be sure to read it afterwards. My lectures are meant to complement the reading and not to replace it. There will be a constant, but manageable, number of reading assignments and if you don't keep up you will find it very difficult to catch-up on the material later. Do the end-of-chapter problems noted in the syllabus after the lecture to make sure you understand the material. The end-of-chapter problems are not handed in or graded. They simply provide a great way for you to gauge your understanding of the material. The TAs will have answers to the end-of-chapter problems so you can check your work during TA office hours.
3. **Be a contributing member of your** group when doing the cases and homework. I recommend that all group members actively discuss and help prepare the answers.

Note that my lecture slides are **not** intended to cover all the important information for the class. The slides are provided online to facilitate note-taking but I also expect you to actively learn from the lecture discussion and to read the textbook. The homework and tests will cover material from class discussion, cases, and (to a lesser extent) from the assigned readings.

To succeed in this course I recommend spending **1 hour each weekday,** on average, outside of class with the assigned readings and/or assignments. Many of the topics build on previous topics so it is important you learn each topic before progressing to new ones. Come to office hours, or set up a time to meet with me, if you have questions.

My Office Hours:

The topic of investments involves a blend of business, economics, and statistics. This combination makes the topic both very interesting and challenging. That is why "front row players" in investments are able to command relatively high salaries. If you are still having difficulties with the material after attending my lectures, reading the assigned readings, and talking to the TAs, you are encouraged to come to my office hours. I have specific hours set aside each week to address student concerns. If you cannot come to my office during these hours you are welcome to email or call me and set up another time to meet. I enjoy working with students and encourage you to seek my help if you need it.

Homework/Cases:

There will be homework for you to do almost every week. I encourage you to work in groups for the homework, however each student needs to hand in his/her own homework assignment. You are also encouraged to meet with the TAs, as necessary, to get help on homework. Show your work on all assignments.

The cases will be done in groups. Only one copy of the case will be turned in per group. Be sure to bring extra copies of your case write-up to class on the day we discuss the case so that after you turn in your

official copy you can respond to questions I ask about the case during the lecture. The cases will be available in the BYU book store under the course name and section number.

Unless told otherwise, hard copies of the homework and cases are due at the beginning of class on the stated due dates. It is officially late after class starts and may be docked points. Please do not email me or the TAs soft copies unless specifically asked to do so.

Help from the TA's:

There will be a TA available to help you in person on homework, or with other aspects of the course, on most weekdays. The TA office hour location(s) will be determined early in the semester and announced in class. If you need to contact the TAs outside of their office hours, please email them. In your email always place "Fin 410" in parenthesis at the start of the subject line. You will end up working with more than one TA during the semester depending on which days you go to their office hours. The TA names and contact information are shown on the first page of the syllabus.

Exams and Quizzes:

Please note the dates of the exams and quizzes on the class schedule. Make up exams and quizzes will be given only for unavoidable circumstances. The exams are closed book and closed notes. Calculators are allowed during the exams and quizzes. The final exam will be comprehensive. Exam questions will cover concepts from the reading, lectures, homework, and cases. If you have a conflict with the schedule then you should contact me prior to that date and receive permission to take the exam on an alternate date. I do not encourage students to reschedule but will consider extenuating circumstances. You should take the quizzes with your section and not in another section.

Grading:

The final grade will be based on 2 midterm exams, a final exam, 14 homework assignments, 8 quizzes, 2 group cases, a report on your virtual stock portfolio, and your class participation. For the participation grade, I will solicit each person's confidential input as to how their fellow group members contributed to their respective groups' cases. I do this to ensure students are awarded for their efforts and to make the participation grade more meaningful. Depending on how the semester flows, it may be necessary to change the total number of quizzes and homework assignments. Regardless of the final number of quizzes and homework assignments their overall weight in the final grade will remain as stated below. The lowest quiz and homework assignment will be dropped at the end of the semester. Final grades will be based on a curve with a mean final grade of 3.4 (B+) across the 3 sections. Based on past years, and the college-mandated requirement of a 3.4 mean grade, most students in the class will get A-'s, B+'s and B's with some A's, B-'s, and a few C's. If there is a student that is failing the course, but that has been attending the classes and doing the work, then at my discretion I may assign additional work to that student to allow the student to pass the class.

Midterm Exams	30%	(15% each)
Final Exam	20%	
Homework	25%	
Quizzes	5%	
Virtual Portfolio Project	5%	
Cases	10%	(5% each)
Participation	5%	(Participation is based on both my assessment of your class participation as well as your group members' input regarding your contribution to your group)

Re-grades:

Occasionally I, or the TAs, will make mistakes in grading. If you believe that there was a mistake in the grading then, within one calendar week following the return of the item (i.e. HW, exam, or case) submit the original item and a separate written explanation of the points of contention to me. If the re-grade request is made after one calendar week or without an accompanying written explanation, no re-grade will be given. All re-grade decisions are final. I will announce on Learning Suite when assignments/ exams are ready to pick up from my office. It is your responsibility to monitor these dates and submit re-grade requests within 1 week of the announced return dates.

Getting Back Graded Work:

All graded work will be filed under your name in my office. You are welcome to come to my office to pick up your work.

Virtual Stock Exchange Project:

As part of the course you are required to participate in an online stock trading game/simulation. The project is done individually and encompasses several of the homework assignments and leads up to the final report. The actual investment performance of your online portfolio will not affect your grade. See the "HW1 – Virtual Stock Trading Assignment" and the "Timeline for Virtual Portfolio Assignments" documents on Learning Suite for more information. The first document will lead you through creating the portfolio. The second document will give you a big-picture description of the various trades and final report that is expected of you.

Classroom Etiquette:

As your instructor I make a strong effort to make the class discussion valuable for your learning. In order to maximize the learning environment during class (and to help you do well on the participation portion of your grade) I ask that you follow the guidelines outlined below.

- Laptops: I encourage you to take notes during the lecture. Some people prefer to do this using their laptops. It is fine with me if you are using your laptops during class to take notes. However, it is not okay to be surfing the internet, checking email, or looking at other material on your laptops during class. Please do not use your laptop for any other purpose during class except to assist you in taking notes.
- Phones: I ask that you turn off your phones and refrain from texting during class unless there is an emergency or you are expecting a critical call from a recruiter.
- Food: Please be considerate of others and refrain from eating during class. If you need to eat, then please do so very quietly and discreetly.
- Conversation: I encourage active participation during the lectures. To keep the discussion orderly, please raise your hand and wait to be called on before talking.

Disclaimer:

I reserve the right to make changes to the syllabus and the class during the quarter.

Honor Code:

In keeping with the principles of the BYU Honor Code, students are expected to be honest in all of their academic work. Academic honesty means, most fundamentally, that any work you present as your own

must in fact be your own work and not that of another. Violations of this principle may result in a failing grade in the course and additional disciplinary action by the university. Students are also expected to adhere to the dress and grooming standards. It is the university's expectation, and my expectation in class, that each student will abide by all Honor Code standards. Please call the Honor Code Office if you have questions about those standards.

Sexual Harassment:

Title IX of the Education Amendments of 1972 prohibits sex discrimination against any participant in an educational program or activity that receives federal funds. The act is intended to eliminate sex discrimination in education and pertains to admissions, academic and athletic programs, and university-sponsored activities. Title IX also prohibits sexual harassment of students by university employees, other students, and visitors to campus. If you encounter sexual harassment or gender-based discrimination, please talk to your professor, contact the Equal Employment Office at 801-422-5895 or 1-888-238-1062 (24-hours), or contact the Honor Code Office at 801-422-2847.

Student Disability:

Brigham Young University is committed to providing a working and learning atmosphere that reasonably accommodates qualified persons with disabilities. If you have any disability which may impair your ability to complete this course successfully, please contact the Services for Students with Disabilities Office (422-2767). Reasonable academic accommodations are reviewed for all students who have qualified, documented disabilities. Services are coordinated with the student and instructor by the SSD Office. If you need assistance or if you feel you have been unlawfully discriminated against on the basis of disability, you may seek resolution through established grievance policy and procedures by contacting the Equal Employment Office at 422-5895, D-285 ASB.

Targeted Learning Outcomes:

This course has been developed to target the learning outcomes listed below. Students that do well in this class will be able to…

- Discuss fundamental concepts of security markets including index construction, how securities are traded over-the counter and on exchanges, the IPO market, buying securities on margin and short-selling, and mutual funds.
- Calculate the expected return and standard deviation of the return for a single security/portfolio given a set of possible outcomes and probabilities.
- Calculate the correlation, covariance, and beta of a security/portfolio with respect to the market given a set of possible outcomes and probabilities.
- Estimate the expected return, variance, correlation, covariance, and beta of a security.
- Understand the tradeoff between risk and expected return as portfolio weights shift between a single risky asset and a risk-free asset (capital allocation line).
- Understand the tradeoff between risk and expected return as portfolio weights shift across several risky securities (efficient frontier).
- Identify the tangent portfolio and use the tangent portfolio in optimal portfolio allocation.
- Derive and chart the efficient frontier, tangent portfolio, and capital allocation line in Excel given the risk and return characteristics for a set of securities.
- Understand the economic intuition behind the Capital Asset Pricing Model (CAPM).
- Understand the economic intuition behind the arbitrage pricing theory (APT).
- Understand and apply basic equity valuation models, including the dividend discount model.
- Understand simple explanations for the term structure of interest rates.
- Understand the concept of duration and know how to use duration to hedge interest rate risk.

Class schedule:

The schedule shown below gives you a general idea about the structure of the course. For updated and current information about assignments, lectures, reading topics, and exams please refer to the schedule posted on Learning Suite. The online version of the schedule will be updated as changes are made to the schedule during the semester. The assigned reading is from the course textbook. The PowerPoint slides used during lecture are posted on Learning Suite in advance of each lecture.

Date	Day	HW/ Cases/ Learning Checks	Assigned Reading from BKM	Lecture Topic Description	Big Picture View of Lecture Topics	Virtual Portfolio Timeline
Aug 31	Mon		Ch 1 2.1-2.3	- Review course expectations - Overview of financial assets. (slide set 1)	These classes and readings are meant to introduce common types of financial securities and to provide an introduction to financial markets.	
Sept 2	Wed		Ch 3	- Introduction to security markets: issuing securities, trading securities, exchanges, trading costs. (slide set 2)	For the most part chapters 2 and 3 focus on concepts and terminology that are important background information for a general knowledge of how financial markets work.	5 initial investments Add price-contingent exits for 2 of the initial investments
Sept 4	Friday	HW 1 due in my office by 5pm				
Sept 7		Labor Day Holiday				
Sept 9	Wed	HW2 due in class at the beginning of class	5.1, 5.3	- Discuss performance measures and review return calculations. (slide set 3)	In lecture 3 we focus on return measures that are useful in discussing financial performance and introduce standard deviation as a measure of risk.	Short something worth at least $50,000
Sept 14	Mon	HW 3 due in class at the beginning of class	5.2, 5.5-5.6	- Risk, return, and the Capital Allocation Line. (start slide set 4)	In lectures 4-5 we build the framework and intuition that will allow us to make asset allocation decisions between risky and risk-free assets.	
Sept 16	Wed	Quiz 1		- Finish slide set 4 - Capital allocation line applications (slide set 5)		
Sept 18	Fri	HW 4 due in my office by 5pm				Clean up portfolio to only include 5 stock investments in preparation for HW 6
Sept 21	Mon	Hint: start working on both HW 5 and 6 early in the week	6.1 -6.4	- Risk and return measures with portfolios. Asset allocation choices using 2 risky assets. (slide set 6)	In lecture 6 we focus on the most efficient combinations of assets to maximize the expected return for a given set of risk characteristics.	
Sept 23	Wed	HW 5 due in class at the beginning of class	2.4 Pages 119-121	- Catch up if necessary - Miscellaneous topics related to chapters 2, 5 and 6: stock indices, deviations from normality, (slide set 7)	In lecture 7 we will discuss several topics related to those covered in earlier chapters.	
Sept 25	Fri	HW 6 Due online by midnight on **Friday the 28th** -- I am making this due on Monday the 28th to try to help those that are going on the recruiting trip on the 24th but my advice for everyone would be to turn it in before the 24th. I recommend you try this during the week when TAs/I am available to answer questions.				
Sept 28	Mon	Quiz 2		- Review for Midterm 1 - Exam questions from prior year(s) are posted to help you study.		

Sept 30	Wed	Case due at the beginning of class		- Partners Healthcare Case Discussion	The Partners Health Care case provides a good application and review of the material thus far.	Report the correlation between the stocks in your portfolio. Invest in 2 new asset classes using ETFs
Oct 5	Mon	No class - Midterm 1 in testing center from Thursday Oct 1 – Monday Oct 5				
Oct 7	Wed		Ch 4, 19.3 section titled "Benefits from International Diversification" page 652	- Investing in other types of assets: mutual funds, ETFs, and ADRs (slide set 8)	Lecture 8 focuses on funds that provide easy access to various country-specific and sector-specific investments.	
Oct 9	Fri	HW 7 due in by office by 5 pm				
Oct 12	Mon	Quiz 3	5.4 10.1 – 10.4 Time Value of Money Review Notes	- Inflation, - Valuation of Bills, and Bonds (slide sets 9 and 10)	Lectures 9 and 10 provide an overview of inflation and discuss how to value bonds and T-Bills.	Invest in something that gives you exposure to international markets, rare metals, and debt Invest in a high yield bond-based fund
Oct 14	Wed	HW 8 due at the beginning of class	10.5-10.6 2.2			
Oct 19	Mon	HW 9 due at the beginning of class	Ch 11	- Interest rate risk, managing bond portfolios (slide set 11)	Lecture 11 discusses how prices change as interest rates change. We discuss how to create a bond portfolio that is immune to interest rate changes.	
Oct 21	Wed	Quiz 4	6.5 – 6.6	- Regression Review, R-square, introduction to alpha (slide set 12)	Lecture 12 reviews regression techniques that are helpful in understanding how the CAPM is used.	
Oct 23	Fri	HW 10 due in my office by 5pm.				
Oct 26	Mon	HW 11 due at the beginning of class	7.1 – 7.3	- Single factor model and CAPM discussion (slide set 13) - Multi factor models and APT (lecture set 14)	Lectures 13 and 14 provide an overview of the CAPM and other common expected return models.	Looking back at your debt investment, does it have high or low duration?
Oct 28	Wed		7.4 – 7.5			
Nov 2	Mon	Case due at the beginning of class		Darden Capital Management Case	The Darden Capital Management case provides a good application of the concepts covered in recent lectures.	
Nov 4	Wed	HW 12 due at the beginning of class Quiz 5		- Review for Midterm 2 - Exam questions from prior year(s) are posted to help you study.		
Nov 09	Mon	No Class – Midterm 2 in testing center from Thursday Nov 5 – Monday Nov 9th				
Nov 11	Wed		13.1-13.3, 13.5	- Equity valuation models (slide set 15)		What are the betas and R-square values for 2 stocks in your portfolio?
Nov 16	Mon	Quiz 6	13.4, 13.6	- Equity valuation models part 2 (slide set 16)		
Nov 18	Wed	HW 13 due at the beginning of class	8.1 – 8.2	- Efficient markets - (slide set 17)		

Nov 23	Mon		Ch 9 "Economic Indicators" section of chapter 12	- Behavioral finance and technical analysis (slide set 18)		Are your investment weights optimal?
Nov 25	Wed	No class				
Nov 30	Mon		8.3 – 8.5	- Tests and evidence regarding efficient markets - Value added even with efficient markets (slide set 19)		
Dec 2	Wed	HW 14 due Quiz 7		- TBD		
Dec 7	Mon	Virtual Portfolio Report Due		Overview of course part 1: review and discussion of key questions and concepts from the first half of the semester.		
Dec 9	Wed	Quiz 8		Overview of course part 2: review and discussion of key questions and concepts from the second half of the semester.		

54. You start work today (Jan 1st) at a new firm for a salary of $50,000 a year. Assume you get paid at the end of the year. Hence at the end of this year you will see a paycheck for $50,000. Each year starting next year you are promised a 6% raise. Assume that inflation will be 0% this year, 6% next year, and 9% the following year. What is your nominal salary for the third year? Will the purchasing power of the 3rd year's salary be higher than the purchasing power for your initial year's salary? (3 points)

55. This is your opportunity to write and answer the question you were expecting to see on this exam <u>but that was not asked</u>. Clearly write the question and solution below. To get credit for this question, your question should be (1) clearly worded, (2) not too simple, (3) use topics that we covered in class, and (4) have a clearly worded solution. If you can't think of a good question that is not too simple you are welcome to write 3 simple questions and their solutions. (3 points)

    Your question:

    Your solution:

Fin 410 Formula Sheet

(1+y)/y

$$\frac{1+y}{y}-\frac{n}{(1+y)^n-1}$$

$$\frac{1+y}{y}-\frac{(1+y)+n(c-y)}{c[(1+y)^n-1]+y}$$

$$PV=\frac{FV}{\left(1+\frac{r}{m}\right)^{m*n}}$$

$$FV=PV\left(1+\frac{r}{m}\right)^{m*n}$$

$$PV=\frac{CF}{r}$$

$$PV=\frac{CF_1}{r-g}$$

$$PV=CF\left[\frac{1}{\frac{r}{m}}-\frac{1}{\frac{r}{m}\left(1+\frac{r}{m}\right)^{m*n}}\right]$$

$$E[r_j]=r_f+\beta_j\left(E[r_m]-r_f\right)$$

$$r=\frac{r_1+r_2+\cdots+r_n}{n}$$

$$D^*=\frac{D}{1+y}$$

$$\frac{\Delta Bond\ Price}{Bond\ Price}=-D^*(\Delta y)=-\frac{D}{1+y}(\Delta y)$$

$$\text{Value}=\sum_{t=1}^{t=\infty}\frac{\text{CF}_t}{(1+\text{r})^t}$$

$$\frac{\Delta Bond\ Price}{Bond\ Price}=-D^*(\Delta y)+(.5)(\text{Convexity})(\Delta y)^2$$

$$Convexity=\frac{1}{Price(1+y)^2}\sum_{t=1}^{n}\frac{CF_t}{(1+y)^t}\left(t^2+t\right)$$

$$\frac{E[r_p]-r_f}{\sigma_p}$$

$$\sigma_z^2=a^2\sigma_x^2+b^2\sigma_y^2+2ab\sigma_x\sigma_y\rho_{xy}$$

$$r\ =[(1+r_1)(1+r_2)\ldots(1+r_n)]^{1/n}-1$$

(1+ real rate) (1+ inflation rate) = (1+ nominal rate)

$$E[r]=\sum_{i=1}^{n}p(r_i)r_i$$

$$Var(r)=\sum_{s=1}^{S}p(s)(r(s)-E[r])^2=\sigma^2$$

$$\rho_{sb}=\frac{Cov(r_s,r_b)}{\sigma_s\sigma_b}$$

$$E[z]\ =\ aE[x]\ +\ bE[y]$$

$$D=\sum_{t=1}^{n}t*(w_t)=\sum_{t=1}^{n}\ t*\left(\frac{\frac{CF_t}{(1+y)^t}}{Bond\ Price}\right)$$

$$\text{ave}\left[\frac{(r-\bar{r})^3}{\sigma^3}\right]$$

$$\text{ave}\left[\frac{(r-\bar{r})^4}{\sigma^4}\right]\text{-3}$$