STAT 482/682: Quantitative Financial Analytics

Date: Fall 2019
Time: TTH 1430 -1545

(Course 10487/10488)
Location: Duncan Hall DH 1070

Course Website – dobelman.rice.edu
We will also be using Canvas

Instructor
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Teaching Assistant (TA)
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Graders
Jessica Wang and Isis Ramirez
(Do not disturb)

Every. Sentence. Here. Is. Important™

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Course Texts


Other Recommended Titles


Greiner, Steven P. (2011), “Ben Graham was a quant; raising the IQ of the intelligent investor,” Hoboken, New Jersey: Wiley.

Greenblatt, Joel, “The Little Book that Beats the Market”


Textbooks

Students are expected to have purchased their required texts during the first week of class. If the text is available at the "Rice" bookstore, and the student elects to purchase the book elsewhere, and this elsewhere-obtained book is not in hand, the student is nonetheless responsible for all assignments and readings. Rice University is generally not able to provide copies of these texts for your use.

Course Objectives and Outcomes

The course will provide a framework for a modern approach to fundamental analytics of securities; the classic works of Graham and Dodd; deconstructing the Efficient Market Hypothesis; Financial Statement Analysis; Capital Market Theory; CAPM; APT; Fama-French Empirical Financial Forecasting, and other data-driven approaches to portfolio construction and maintenance. Graduates of this course will be able to think like businesspeople, and stand
head-to-head with both the quantitative analysts and the corporate finance masters'. Students will be able to perform value-added quantitative financial analysis of a wide variety of scenarios in a minimum timeframe.

**Course Approach**

This is a project-based, Socratic lecture course; teamwork and class participation are required. It is designed to help prepare you for success in quantitative careers such as security analysis, portfolio management and financial data analysis. From time to time industry experts will be sharing their insights with the class in the form of guest lectures.

**Course Content and Reading List**

This course covers many topics, some of which you may be unfamiliar with. For a weekly schedule of topics and reading assignments, see the website [READING LIST](#). We plan to cover most things which will arise as the course progresses. However, you should use a good online encyclopedia in case you have specific questions about topics we have not discussed yet, but which might arise while you are working on other assignments. Topics/chapters include

1. Foundational Vocabulary and Concepts; The Challenge; The Investment Environment; Venture Structure & Governance
3. The Securities Markets and Macroeconomics
4. Financial Statement Analysis; Enterprise Valuation/Capital Structure and Cost of Capital
5. Essential Forecasting Techniques
6. Analysis of Fixed Income Securities, including rating agencies
7. Analysis of Common Stocks; Valuation models; Growth/risk, Convertibles, etc.
8. Futures and Options
10. Portfolio Analysis; Capital Market Theory; Efficiency and Imperfections

**Grading**

Grading for this course will consist of:

- Homework exercises (20%)
- "Mini-Projects" (25%)
- Final project (35%)
- Class Participation (10%)
- Team Evaluation (10%), consisting of [self and instructor evaluations](#).
The homework, mini-projects and final project are to be completed as team projects. Students taking the graduate-level STAT 682 will have additional assignments, with the same grading breakdown as STAT 482.

**Building a Team**

Building and working as a team are critical to your success in this course. You should form a team with requisite skills: good coders, good background in finance, excellent writing ability, and responsiveness to communications. The TA will be helping you put together your team, but it is your responsibility to form it.

**Professional Standards**

All assignments, with exception of handwritten math proofs and things of that nature, must be prepared in the form of a professional report. You should be able to take one of your reports/project write-ups and present to the management of your employer or advisor. This means you need to organize it with appropriate layout, graphics, citations, etc. Unnecessary printouts of numbers are not acceptable, nor are meaningless digits of precision, etc. The font should be large enough for management to easily read (no less than 10-point font, preferably 11-12). You should include a cover page indicating the class, assignment, date submitted, and name of student or group members and group number.

In the real world, if your management or customers cannot read the report, or if it is filled with superfluous information, they will just ignore it and possibly return it to you with a request to resubmit. If you are unlucky, they will just pass you over for someone who does these things better.

You are encouraged to make appointments with the peer consultants at the Center for Written, Oral, and Visual Communication for your assignments in this course. These consultants do not proofread or edit your work, but they will provide feedback on topics such as the organization of your paper or presentation, the coherence of your argument, appropriate sentence structure, and grammatical errors. You can make an appointment at the Center’s website: [http://cwovc.rice.edu/](http://cwovc.rice.edu/).

The Professional Standards checklist and other grading rubrics are posted on the website at “[Professional Standards](http://cwovc.rice.edu/)”. Besides outstanding examples of previous classwork in Canvas Files/Projects/Gallery of Great Ones/, many examples of good professional reports are in Canvas’ Files/Policies_Professional Standards/Example Professional Reports/. You should review several of these to get a flavor of what we are expecting from you.

**Originality**

Although some assignments are not "pledged", keep in mind that plagiarism is a serious problem, and is especially problematic for the student or researcher. Plagiarism will be treated, for pledged assignments, in accordance with the honor code provisions; and for non-pledged assignments, your paper will be returned for a rewrite with the automatic deduction of
one letter grade. By plagiarism we mean "quoting, paraphrasing, or otherwise using another’s words or ideas as one’s own without properly crediting the source." Unfortunately, with the prevalence of internet sources, it is sometimes easy to inadvertently commit plagiarism. You should consult this white paper and http://futureowls.rice.edu/futureowls/Honor_Code.asp for guidance on how to avoid this problem.

**Citation**
Any cited works in your reports must have citations listed, either as a separate section, or (less desirably) as footnotes. Exact citation format is your choice\(^1\), but be consistent.

**Use of Canvas**
The Canvas system is the course management tool for announcements, assignments, resources, etc. *Do not email the instructor/TA* questions about the course or assignments, but rather post as a discussion on Canvas so that all can see the conversation. Any such emails will be ignored. If online submission for assignments is required, please upload in the appropriate area (usually in the assignments section).

**Assignment Philosophy**
Since this is an upper level course, some assignments may be posed in general, and sometimes (partially intentionally) “vague” language. The purpose of this is to help develop the student’s analytical ability and skills to research new concepts and topics. A little research or coordination with the TA/instructor will generally lead to a fuller understanding of what is needed.

**Assignment Submission, Lateness and Grading Policy**
Unless otherwise instructed, all assignments must be submitted by the due date deadline as hard copy to the instructor or designee, with a soft copy submitted on Canvas as well. If hard copy is not received, no grade will be given. The instructors/TA will not be able to print e-mailed or online-only assignment submissions. Late papers will in general not be accepted without a university approved excuse. A 20% penalty for HW turned in by next class may be applied; no credit for submissions later than this, although you might be able to negotiate with the grader. Additional guidance on homework submission and project policies is posted on Canvas and is also available here.

**Exams.**
No examinations are planned for this semester. Two reading comprehension quizzes will be administered which will count with the mini-project assignment grading.

**Mini-Projects**
Mini-projects will be assigned during the semester in lieu of formal textbook or other research assignments. These are intended to be worked on in groups, and should utilize the efforts and

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\(^1\) See for example https://owl.english.purdue.edu/owl/section/2/
ideas of the whole group for about a 2-week period. These assignments will be posted on Canvas. You may pick your own team members, but the size of each team will be limited to an appropriate number (no more than three to four).

**Final Project**
A final project will be assigned which will be completed in the groups/teams which you have previously established. Sometimes a quantitative case is provided, other times the project may be based on your own research ideas, or on the various case studies included in your textbooks. You and your team will select a case/topic, and submit a brief prospectus to the instructor for approval. More guidance on the final project will be given in class, and a Powerpoint presentation of project ideas is periodically updated and available on Canvas in *Files/Projects/Final Project/*

**Attendance**
Students are expected to attend class. Much material is presented in class which might not otherwise be in texts, notes, etc. We will also be having guest lecturers from time to time, and it is rude to the speaker if the class members are absent. Attendance will be reflected in the Class Participation portion of the course grade which contributes a full 10% of your grade. Although we plan on keeping the course website up to date, if a student misses a class, then s/he is responsible for keeping up with the course material and finding out if any exams, quizzes, or homeworks have been assigned or scheduled. Similarly, important due date changes might sometimes be made in class to your benefit which might not be immediately posted on Canvas.

**Laptops and Wearable/Portable Electronic Devices (PED).**
Unless so requested by the instructors, please do not use these devices during class, they are a distraction to other students. Prohibited devices include laptops, headphones, earbuds, gaming devices, mp3/music/media players, cell/smart-phones, PDA's, Kindle/e-book readers, tablet computers/readers, Apple watch/i* devices, multi-purpose wrist communicators, cameras, GPS/GIS devices, Google glasses, VR devices, etc. etc. Hearing aids are acceptable to use in accordance with the last item (disabilities) and procedures herein. From time to time the instructors may ask a student to look something up, but in most cases this is not necessary. If the student requests, such devices may be permitted, if the purpose is clearly articulated in advance. The student will be asked to put away their PED's if they are taken out in class; upon the second request, the student will be dismissed from class.

**Software**
It is impossible to perform statistical/quantitative data analysis today without some sort of computer software, and it is expected that the student will become proficient with one or more statistical software packages. The most widely used data analysis software in the real world today is Microsoft Excel, and its capabilities are impressive. However, more specialized software is sometimes needed, such as Matlab, R/S-Plus, SAS, Python, SQL, Resampling Stats, SPSS, Stata, StatTools, StatExact, Lisrel, @Risk, Maple, Mathematica, C-Plex, etc. Of
these, R and Python have become the choice of many because of their relative ease of use and low cost (FREE!) Download information for some of these packages is available on the course website(s).

One can also program most statistical procedures in a "high-level" programming language such as Java, C++, Fortran, VB, etc., along with specialized add-in routine libraries, but these require a lot of work to code and debug. Additionally, you will find that most corporate employers will not be paying for the nice software that is available for you here on campus. Consequently, to enhance your value to your future employer, we suggest that you become proficient in Excel, R/Python and SQL/SAS. Note that a good word processor will also be required in order to prepare reports and presentations; Microsoft Word, OpenSource, LaTeX, etc., are candidates for use in preparing these documents, although use of LaTeX in the business world is sparse. Online collaborative solutions such as Google Docs may be useful for initial collaboration, but your final work product will be a standalone document; please submit all work as a Microsoft product (i.e., not .wpd, .pages, etc.). Additionally, not all persons have the required Google account in order to use Google Docs.

**Data Access**

It is impossible to conduct quantitative financial ANYTHING without access to timely and accurate data. We are interested in pricing data, financial data, and in some cases economic data. In an era passed, much of the analysts' time was spent in back rooms pouring over company annual reports and slowly filling in the blanks on the columnar pad. Then the columnar pad was replaced with Visicalc and Lotus spreadsheets. These then turned into Microsoft Excel. And it remains this way today, except the annual reports are in some cases easier to obtain. (Unless you need annual reports very far into the past; it turns out most libraries no longer collect these reports).

A large part in developing your skills as quantitative analysts is being able to find the data that you need, to clean it, and prepare for its use in downstream analysis. Fortunately, with the internet things are very easy today. However, "cut and paste" from websites is becoming increasingly more difficult, even with Excel's capability for snatching data via web queries. This is in part because Excel web query development is not keeping pace with websites' tendency to not put data in static html table format.

For example, suppose you are trying to get the components of the United States S&P 500 index; at one time you could get them from finance.yahoo.com; however, as of 2012 Yahoo has discontinued availability of downloadable S&P500 constituents. The DJIA constituents are still available, but they have changed their method so that you have to download a page at a time which is a lot of work. You could get them in bulk from Standard & Poor’s

2 See, for example, [http://www.cboe.com/DelayedQuote/QuoteTable.aspx](http://www.cboe.com/DelayedQuote/QuoteTable.aspx). Enter a symbol, the data will appear but not be accessible via Excel web query because the query is based on static html tables.
Fee-based data vendors make data collection easier and more targeted or consistent; unfortunately, the access is expensive ($3,000-$10,000 per month), and no single vendor has everything you need (not even Bloomberg!) Fortunately for the Rice University student, several of the most expensive and useful databases are available, and we will be using them extensively. (WRDS CRSP and Compustat). We have established a class account for your use, and will provide limited overviews of how to use them, but it is your responsibility to learn how to navigate in the system and to validate the data that you might need to download. Please use the class account, DO NOT request WRDS access from the university coordinator.

Additionally, the Jesse H. Jones Graduate School of Business (JGSB) is providing us access to its El Paso Corporation Finance Center (EPFC). In the EPFC you will have access to several very expensive data vendors such as ARGUS Valuation, Bloomberg Professional, Capital IQ, FactSet, Morningstar Principia, Palisade @Risk, Reuters 3000Xtra, and S&P Research Insight. Use of these data sources is limited only by your imagination. You will need to attend the overview session and sign the access agreement in order to gain access. For more information watch for Canvas announcements and see the website: http://business.rice.edu/facility/el-paso-corporation-finance-center.

**Rice Honor Code**

Before enrolling in this course, you must understand and agree to abide by the Honor System in place at Rice University which protects the academic integrity of all coursework. All students (including graduate students) at Rice are bound by the Rice Honor Code. The Honor Code is a unique feature at Rice, one that is valued highly, and is of profound importance. New students should familiarize themselves with the Honor Code before starting classes. Honor Code violations are very serious and can lead to dismissal from the University. Suspected violations will be processed in accordance with applicable procedures; see http://honor.rice.edu.

Examinations, if held, are conducted under pledged conditions. Proper recitation and use of the Honor Pledge on examinations will normally be worth 5% of the exam grade.

If homework and individual assignments/projects may be worked on with other class members, each student must submit their own work for credit. Homeworks should be submitted by each person, but you should indicate with whom you worked when applicable. No direct copying is allowed. Group projects and assignments may be submitted by the group, per submission requirements above.

**Sponsored Message Regarding Student Responsibility**

The Committee on Examinations and Standing has asked that we reiterate the responsibilities of the student to comply with deadlines affecting their status and standing. Essentially this
means that you need to be aware of the deadlines for which you alone are responsible (i.e., not your advisor, etc.). This data is maintained at registrar.rice.edu/calendars.

**Summary of Links**

Course Website - [http://www.stat.rice.edu/~dobelman/courses/index.html](http://www.stat.rice.edu/~dobelman/courses/index.html)


Canvas login - [http://www.rice.edu/canvas/](http://www.rice.edu/canvas/)

Textbooks:
- Pedersen - [http://www.hvass-labs.org/books/](http://www.hvass-labs.org/books/)
- SEC filings - [https://www.sec.gov/edgar/searchedgar/companysearch.html](https://www.sec.gov/edgar/searchedgar/companysearch.html)

Course outline and Schedule - [http://www.stat.rice.edu/~dobelman/courses/Reading.682.txt](http://www.stat.rice.edu/~dobelman/courses/Reading.682.txt)


Center for Written, Oral, and Visual Communication - [http://cwovc.rice.edu/](http://cwovc.rice.edu/)

Citation resources - [https://owl.english.purdue.edu/owl/section/2/](https://owl.english.purdue.edu/owl/section/2/)

Avoiding Plagarism:

Data:
- WRDS/CRSP - [http://wrds-web.wharton.upenn.edu/wrds/](http://wrds-web.wharton.upenn.edu/wrds/)

Registrar academic schedules and deadlines - [http://registrar.rice.edu/calendars/](http://registrar.rice.edu/calendars/)

Rice Honor code:
- Honor procedures - [http://honor.rice.edu](http://honor.rice.edu)

Disability Support Services (DSS) - [http://dss.rice.edu/](http://dss.rice.edu/)

**Disabilities**

Any student with a documented disability needing academic adjustments or accommodations is requested to speak with the instructor during the first two weeks of class. All discussions will remain confidential. Students with disabilities should also contact Disability Support Services in the Ley Student Center. Further information is available at [http://dss.rice.edu/](http://dss.rice.edu/).

**Changes to Syllabus**

Changes to this syllabus may be published from time to time, with notice and explanation given in class and via Canvas (if used).

[ToP]