



**NATIONAL UNIVERSITY  
OF SINGAPORE**  
*Department of Finance*



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**Consultation Hrs:** By appointment through email

## **Course Objective**

This course aims to prepare the student for academic research work in the area of finance by introducing the contemporary research methods. Academic research work differs from some industry research work in the higher emphasis on sound scientific basis. This allows the scientific theories to be verifiable, falsifiable and repeatable. This course would also compliment the needs of the Honors year research project by familiarizing the student with using the financial database and statistical software. Students shall be exposed to published and important finance research papers as well.

## **Motivation**

With the increasing sophistication in financial instrument and practices, it is important to learn the scientific way to establish new finance theories. Some practitioners base their theories on situational and non-objective evidence that led to mis-priced models and error-prone applications. Their theories may seem to work perfectly for a certain period of time, but proves to be false beyond the period of mere coincidence. When the theories no longer work, they may lead to losses for the company or bank, and they may even trigger an economy wide crisis.

It is therefore important to learn how to adequately verify a new finance theory. Empirical data need to be obtained and treated in the correct way, and the appropriate statistical analysis be conducted accurately. Objective and justified inference and deductions can then be obtained from the research. Such scientific methodology is no longer necessary only for academic research, but necessary for industry professionals in the area of regulation, setting fiscal and monetary policies, risk management, portfolio optimization and even corporate finance.

## **Learning Outcome**

By the end of the course, students shall:

- learn some of the commonly used statistical analysis used in finance research
- know of some important finance papers often cited in finance research
- be familiar with handling some of the commonly used database in finance research

## **Mode of Teaching**

The course will be delivered as a series of 13 three-hour sessions in a computer lab. In each session, the student will go through each statistical analysis method hands-on with the computer as they are covered

in class. The WRDS database and the SAS statistical software will be covered. The class would have a WRDS user account to access the database. Each computer needs to have

- 1) Internet access
- 2) SSH Secure Shell and FTP.

## **Flipped Classroom**

The course will be delivered using the flipped classroom methodology. In the flipped classroom methodology, students are to learn their "lectures" at home and do their "homework" in class. This is detailed in the following points:

- 1) Students shall watch the videos and learn the lesson before the class session.
- 2) Each student will take an individual closed-book quiz at the start of each class.
- 3) Students will do worksheets in groups. The worksheets will cover the material of that week.

### **Advantages**

- 1) Students can understand the lecture at their own time and pace.
- 2) Students have closer coaching by the instructor during class.
- 3) Students are trained in doing group work.
- 4) Students learn to take responsibility for their own learning, and develop the skills for life long learning.

### **Pre-requisite**

ST1131A Introduction to Statistics, or DSC2008 Business Analytics (or equivalent)  
FIN3101 Corporate Finance  
FIN3102 Investment Analysis

### **References**

There is no main text, the following are used as supporting references:

Richard A. DeFusco, Dennis W. McLeavey, Jerald E. Pinto, David E. Runkle, Mark J. Anson, Quantitative Investment Analysis, Wiley, 2nd edition, (ISBN: 978-0470052204)

Wooldridge, Jeffrey M., Introductory Econometrics: A Modern Approach, 4th edition, South-Western College Pub, 2008 (ISBN: 978-0324660548)

Lora D. Delwiche, Susan J. Slaughter, The Little SAS Book: A Primer, 4th Edition, by SAS Publishing, 2008 (ISBN: 978-1599947259)

Campbell, John Y., Lo, Andrew W., and MacKinlay, A.Craig., The Econometrics of Financial Markets, Princeton University Press, 1996 (ISBN: 978-0691043012)

Geoff Der, Brian S. Everitt, A Handbook of Statistical Analyses using SAS, 3rd edition, Chapman and Hall, 2008 (ISBN: 978-1584887843)

Vivek Ajmani, Applied Econometrics Using the SAS System, Wiley, 2009, (ISBN: 978-0470129494)

John C. Brocklebank, David A. Dickey, SAS for Forecasting Time Series, 2nd Edition, Wiley-SAS, 2003, (ISBN: 978-0471395669)

## Assessment

This is a 100% CA course. The weight distribution for different components is as follows:

Mid-Term	30
Final Quiz	30
Project & Presentation	30
Class Participation	10
<b>Total</b>	<b>100</b>

### Mid-Term Quiz

Date: Week of Sep 28 (In Class)

The mid-term quiz will be a 2 hour close-book quiz. It will be held during class hours. Students are to make sure that they are available to sit for the mid-term.

### Final Quiz

Date: Week of Nov 9 (In Class)

The final quiz will be a 2-hour close-book quiz. It will be held during class hours. Students are to make sure that they are available to sit for the mid-term.

### Group Project

Groups of four or five students each will be formed on the first week. Topic will be assigned during the course.

### Other points to note

- **Attendance:** Since this is a 100% CA course, students must not miss more than 2 classes (not including absence due to medical (accompanied by medical certificates) or compassionate reasons). Violators will be heavily penalized or may even fail the entire module.
- **CA Attendance:** Students who miss any CA component will receive zero marks for that particular component. Absentees due to medical (accompanied by medical certificates) or compassionate reasons may be given a substitute form of assessment.
- Students are encouraged to always feedback to the instructor comments and suggestions that may help the class to learn better.
- Students are to check the IVLE weekly for announcements.
- Please use the forum in IVLE exclusively for students' discussions
- Please use NUS e-mail for e-mail communications

### Academic Honesty & Plagiarism

Academic integrity and honesty is essential for the pursuit and acquisition of knowledge. The University and School expect every student to uphold academic integrity & honesty at all times. Academic dishonesty is any misrepresentation with the intent to deceive, or failure to acknowledge the source, or falsification of information, or inaccuracy of statements, or cheating at examinations/tests, or inappropriate use of resources.

Plagiarism is 'the practice of taking someone else's work or ideas and passing them off as one's own' (The New Oxford Dictionary of English). The University and School will not condone plagiarism. Students should adopt this rule - You have the obligation to make clear to the assessor which is your own work, and which is the work of others. Otherwise, your assessor is entitled to assume that everything being presented for assessment is being presented as entirely your own work. This is a minimum standard. **In case of any doubts, you should consult your instructor.**

Additional guidance is available at:

<http://www.nus.edu.sg/registrar/adminpolicy/acceptance.html#NUSCodeofStudentConduct>

Online Module on Plagiarism:

<http://emodule.nus.edu.sg/ac/>

### Tentative Lesson Schedule:

Lesson	Week Starting	Topic and Activity
1	Aug 10	<ul style="list-style-type: none"> <li>• Introduction to Research</li> <li>• The WRDS Database</li> </ul>
2	Aug 17	<ul style="list-style-type: none"> <li>• Basic Statistics</li> <li>• ANOVA</li> </ul>
3	Aug 24	<ul style="list-style-type: none"> <li>• Simple and Multiple Regression 1</li> </ul>
4	Aug 31	<ul style="list-style-type: none"> <li>• Simple and Multiple Regression 2</li> <li>• Panel Data</li> </ul>
5	Sep 7	<ul style="list-style-type: none"> <li>• Logit and Probit Regressions</li> </ul>
6	Sep 14	<ul style="list-style-type: none"> <li>• Event Studies</li> </ul>
	Sep 21	<b>Recess Week</b>
7	Sep 28	<b>Quiz 1 (2 hr)</b>
8	Oct 5	<ul style="list-style-type: none"> <li>• Instrumental Variables</li> <li>• Granger Causality</li> </ul>
9	Oct 12	<ul style="list-style-type: none"> <li>• Factor Analysis, Principal Components</li> </ul>
10	Oct 19	<ul style="list-style-type: none"> <li>• Unit Root Test, ARIMA</li> </ul>
11	Oct 26	<ul style="list-style-type: none"> <li>• ARCH/GARCH</li> </ul>
12	Nov 2	<ul style="list-style-type: none"> <li>• Cointegration</li> <li>• Vector Autoregression</li> </ul>
13	Nov 9	<b>Quiz 2 (2 hrs)</b>