George Mason University  
School of Business  
Spring 2016  

Finance 430- Empirical Methods in Finance  

**Instructor:** Dr. George H. K. Wang  
Room 223, Enterprise Hall, Phone: 703-993-3415  
Fax: 703-993-1870  
E-mail: Gwang2@gmu.edu  

Office Hours: Monday and Tuesday 3:30 PM to 4:30 PM or by appointment  

**Texts:**  

**Course Description:** The purpose of this course is to acquaint students with basic econometric techniques which are applicable to financial data analysis. The following topics will be covered: (1) some basic probability concepts and return distributions; (2) A review of elementary statistical inference (3) Simple and multiple regression models: specification and estimations; (4) Inferences in regression models (5) Diagnostic checking on the regression residuals; (6) Regression models with time series data; (7) Estimation of index models and capital asset pricing model and (8) Measuring and modeling volatility, correlations and liquidity. Throughout the course, emphasis will be placed on the understanding the fundamental concepts of financial econometric techniques. R computer language will be used to analyze real world problems.  

This course will build a foundation upon which to pursue further study in advanced topics in Portfolio Management, Derivatives, Risk Management and Financial Engineering. This course will also help students to prepare for level 2 examination for CFA. The knowledge of R computer language is a valuable asset.
for seniors in the job market. The current demand for quantitative financial analysts is very high. Master this course and you will be rewarded in the future.

**Grading:**

<table>
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<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Mid-term exam</td>
<td>30%</td>
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<tr>
<td>Final exam</td>
<td>35%</td>
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<tr>
<td>Problem sets and projects**</td>
<td>35%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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**Prerequisite:** Decision Science 201 and nine hours upper level FNAN courses.

**Attendance**  
Students are strongly encouraged to attend every class meeting. Anyone who thinks that he/she has a chance of missing more than four classes should definitely take a different course.

**Etiquette in the Class Room**  
Students must turn off all phone, beepers, etc. when attending class. No one has permission to tape record any part of any lecture or any discussion in the class. CONSIDERATION AND POLITESS REQUIRE THAT STUDENTS REFRAIN FROM HAVING PRIVATE CONVERSATIONS WHILE CLASS IS IN SESSION.

**Examinations**  
Students who wants to take an examination at other than at the scheduled time must get prior permission from the instructor who is unlikely to give it unless the student has a serious medical problem (documented by the attending physician in writing).

**Course Outline and Tentative Schedule***

<table>
<thead>
<tr>
<th>Week and dates</th>
<th>Topics [ DeFusco, McLeavey, Pinto and Runkle (DMPR), (2006) and Tsay{2013}</th>
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<tbody>
<tr>
<td>1. 1/19 and 1/21</td>
<td>Financial data and their properties ,Review on Time Value of Money and Discounted Cash Flow Applications (Chapters 1 and 2 (DMPR, 2006)), Introduction to R ( Tsay, Chapter 1)</td>
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<tr>
<td>2. 1/26 and 1/28</td>
<td>Statistical Concepts and Market Returns (Chapter3, (DMPR, 2006),</td>
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<td>3. 2/ 2 and 2/4</td>
<td>Statistical Concepts and Market Returns (Chapter3, (DMPR, 2006), Probability Concepts (Chapter 4, (DMPR, (2006)) Lecture notes (Wang)</td>
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<td>4. 2/9 and 2/11</td>
<td>Common Probability Distributions (Chapter 5 (DMPR, 2006)) and</td>
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<tr>
<td>5. 2/16 and 2/18</td>
<td>Common Probability Distributions (Chapter 5 (DMPR, 2006)) and</td>
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<tr>
<td>6. 2/23 and 2/25</td>
<td>Sampling and Estimation (Chapter 6, (DMPR, 2006))</td>
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<tr>
<td>7. 3/1 and 3/3</td>
<td>Hypothesis Testing (Chapter 7, DMPR (2006))</td>
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8. 3/7 and 3/13  
   **Spring breaks**

9. 3/15 and 3/17  
   Correlation and simple Regression (Chapter 8, (DMPR 2006) and **and Mid-term Examination (3/17)**

10. 3/22 and 3/24  
    Multiple Regression and Issues in Regression Analysis (Chapter 9, DMPR (2006))

11. 3/29 and 3/31  
    Problems in Regression Analysis (Chapter 9, DMPR (2006) and ,

12. 4/5 and 4/7  
    Univariate Time Series Analysis (Chapter 10, (DMPR, 2006))

13. 4/12 and 4/14  
    Portfolio Concepts (Chapter 11, Section1-3, DMPR (2006))

14. 4/19 and 4/21  
    Portfolio Concepts (Chapter 11 Section 4, DMPR (2006)) and 
    Alternative Measurements and Models for liquidity, 
    Volatility and Correlations (lecture notes),

15. 4/26 and 4/28  
    Alternative Measurements and Models for liquidity, 
    Volatility and Correlations (lecture notes)

16. 5/3  
    Reading day

17. 5/10  
    (1:30PM- 4:15 PM) **Final Examination**

Note: Last day to drop  2/19

* Adjustments might be made later, except as regards the schedule of final examination.

* Problems will be assigned as the semester progresses.

**Honor Code:**  Students are expected to observe the GMU Honor Code.

Suggestion for furthering readings:


(2) Berndt, Ernst, R. *The Practice of Econometrics: Classic and Contemporary*, 1991,
Addison-Wesley, Boston, Massachusetts.


** (Short Bio) George H. K. Wang is the Research Professor of Finance at the School of Management at George Mason University. He received his Ph. D in statistics and economics (double majors) from Iowa State University, Ames, Iowa. He was the Deputy Chief Economist and Director of Research, U. S. Commodity Futures Trading Commission. Dr Wang was visiting Professor of Finance, Faculty of Economics and Business, University of Sydney, Sydney, Australia in summer, 2006, 2007 and Winter 2014, Visiting Professor, CRC Capital Markets, Sydney, Australia 2010 and Visiting Professor at National Central University, Taiwan in July 2007 and 2009. He has published widely in major refereed journals in the areas of derivative markets, applied time series, econometrics, mortgage markets and transportation. He is an elected ordinary member of International Statistical Institute and on the editorial board of the Journal of Futures Markets.