FNAN 491
Probability Methods for Finance
Fall 2015

SPECIFIC COURSE INFORMATION
FNAN 491, Probability Methods for Finance
Class Location: Enterprise Hall, Room 174
Class Meeting Time: 10:30 a.m. to 1:10 p.m.
Class Meeting Dates: Mondays during the period Aug. 31 to Dec. 21, 2015.

PROFESSOR’S CONTACT INFORMATION
David R. Gallay, D.Sc.
Enterprise Hall, Room 174
Telephone numbers: (703) 993-1869
E-mail address: dgallay@gmu.edu
Office hours: Tuesdays and Thursdays, 3 to 4 p.m., and by appointment

COURSE WEBSITE ADDRESS
Course Blackboard Web Site: http://mymasonportal.gmu.edu. At this site, you can access course materials (e.g., lecture slides) and course assignments.


COURSE MATERIALS

Case studies. (Registration to access these cases are at https://cb.hbsp.harvard.edu/cbmp/access/36923922)
  • Avalanche Corporation: Integrating Bayesian Analysis into the Production Decision-Making Process
  • C-Energy’s Red Hill Plant: Meeting the SO\textsubscript{2} Challenge
  • Sprigg Lane (A)

PROGRAM LEARNING GOALS
Upon successful completion of this course, you will be able to
1. Value complex projects, assets and securities.
2. Demonstrate, evaluate, and explain the risk return trade-offs in finance.
4. Recognize and understand how to address ethical issues in finance including agency problems.
COURSE OBJECTIVES

The objective of this course is to provide financial analysts with a basic understanding of probability methods and advanced skills in spreadsheet modeling to perform meaningful financial feasibility analyses of capital projects and risk assessments of financial investments, as well to make better capital budgeting decisions.

COURSE SCHEDULE

Session 1
Date and time: Aug. 31, 2015, 10:30 a.m. to 1:10 p.m.
Topic: Introduction, including Bayesian methods
Readings: none.
Homework: none.

Session 2
Date and time: Sept. 14, 2015; 10:30 a.m. to 1:10 p.m.
Topics: Simulation and Conditional Probability
Readings: Myerson, Chap. 1.

Session 3
Date and time: Sept. 21, 2015; 10:30 a.m. to 1:10 p.m.
Topic: Discrete Random Variables
Readings: Myerson, Chap. 2.
Homework: Myerson – Prob. 2-1, 2-3, and 2-4 (due Sept. 28).

Session 4
Date and time: Sept. 28, 2015; 10:30 a.m. to 1:10 p.m.
Topic: Utility Theory and Constant Risk Tolerance and Continuous Random Variables
Reading, Myerson Chap. 3 and Chap. 4
Homework: Myerson – Prob. 3-1, 3-2, 4-4, and 4-5 (due Oct. 5).

Session 5
Date and time: Oct. 5, 2015; 10:30 a.m. to 1:10 p.m.
Topic: Correlation and Multivariate Normal Random Variables
Reading, Myerson Chap. 5.
Homework: Myerson – Prob. 5-2 and 5-3 (due Oct. 13).

Session 6
Date and time: TUESDAY, Oct. 13, 2015; 10:30 a.m. to 1:10 p.m.
Topic: Conditional Expectations
Reading, Myerson Chap. 6.
Homework: Myerson – Prob. 6-1, 6-3, and 6-4 (due Oct. 19).
**Session 7**
Date and time: Oct. 19; 10:30 a.m. to 1:10 p.m.
Topic: Optimization of Decision Variables
Reading, Myerson Chap. 7.
Homework: Myerson – Prob. 7-1, 7-4, and 7-5 (due Oct. 26).

**Session 8**
Date and time: Oct. 26, 2015; 10:30 a.m. to 1:10 p.m.
Topic: Risk Sharing and Finance
Reading, Myerson Chap. 8.
Homework: Myerson – Prob. 8-1, 8-2 and 8-3 (due Nov. 2).

**Session 9**
Date and time: Nov. 2, 2015; 10:30 a.m. to 1:10 p.m.
Topic: Dynamic Models of Growth and Arrivals
Reading, Myerson Chap. 9.
Homework: Myerson – Prob. 9-1, 9-3, and 9-4 (due Nov. 9).

**Session 10**
Date and time: Nov. 9, 2015; 10:30 a.m. to 1:10 p.m.
Topic: Real Options
Reading, None
Homework: TBA

**Session 11**
Date and time: Nov. 16, 2015; 10:30 a.m. to 1:10 p.m.
Topic: Real Options II
Reading, None:
Homework: Sprigg Lane (A) Case (written analysis due Nov. 23.)

**Session 12**
Date and time: Nov. 23, 2015; 10:30 a.m. to 1:10 p.m.
Topic: Case Study Analysis: Sprigg Lane (A)
Homework: C-Energy’s Red Hill Plant Case (written analysis due Nov. 30).

**Session 13**
Date and time: Nov. 30, 2015; 10:30 a.m. to 1:10 p.m.
Topic: Case Study Analysis: C-Energy’s Red Hill Plant
Homework: Avalanche Corporation Case (written analysis due Dec. 7).

**Session 14**
Date and time: Dec. 7, 2015; 10:30 a.m. to 1:10 p.m.
Topic: Case Study Analysis: Avalanche Corporation
Homework: none.
STUDENT RESPONSIBILITIES
Students are expected to be prepared for class, do their homework, and participate in class discussions.

CLASS POLICY
Assignments are due at the beginning of class. Either soft-copy or hard-copy submissions are acceptable. Late submissions will not be accepted unless the student has obtained permission from the instructor prior to the submission date.

GRADING STANDARDS
Grades will be awarded on the basis of your exam scores, homework, case study analysis, and your contribution in class.

Grading criteria for your case analyses:
Case analysis format:
- Executive summary (including your recommendations)
- Methodology or techniques (which are best used for the problem)
- Analysis (complete and logical process employed)
- Conclusion/recommendations and concerns

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<thead>
<tr>
<th>Executive summary</th>
<th>Methodology/techniques used</th>
<th>Presentation of analysis</th>
<th>Conclusion and concerns</th>
<th>Writing style/format</th>
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<tr>
<td>15%</td>
<td>25%</td>
<td>40%</td>
<td>10%</td>
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Grading criteria for your homework:
- Excellent: accurate and clear response to all questions (A / A-)
- Good: accurate and clear responses to most questions, with limited number of minor inaccuracies or omissions and no major inaccuracies or omissions (B+ / B)
- Marginal: significant omissions or inaccuracies in responses to one or more questions (B)
- Unsatisfactory: significant omissions or inaccuracies in responses to most questions (C)

Final Grade Weights

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<tr>
<th>Graded Material or Activity</th>
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<tr>
<td>Homework</td>
<td>60%</td>
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<tr>
<td>Case Analysis Project</td>
<td>30%</td>
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<tr>
<td>Class Participation throughout the Course</td>
<td>10%</td>
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Letter grades are: A, A-, B+, B, B-, C, or F. Expected overall class GPA for this course ranges from 3.40 to 3.60.

SCHOOL OF BUSINESS STANDARDS OF BEHAVIOR
The mission of the School of Business at George Mason University is to create and deliver high-quality educational programs and research. Students, faculty, staff, and alumni who participate in these educational programs contribute to the well-being of society. High-quality educational programs require an environment of trust and mutual respect, free expression and inquiry, and a commitment to truth, excellence, and lifelong learning. Students, program participants, faculty, staff, and alumni accept these principles when they join the School of Business community. In doing so, they agree to abide by the following standards of behavior:

- Respect for the rights, differences, and dignity of others
- Honesty and integrity in dealing with all members of the community
- Accountability for personal behavior

Integrity is an essential ingredient of a successful learning community. Ethical standards of behavior help promote a safe and productive community environment, and ensure every member the opportunity to pursue excellence. School of Business can and should be a living model of these behavioral standards. To this end, community members have a personal responsibility to integrate these standards into every aspect of their experience at the School of Business. Through our personal commitment to these Community Standards of Behavior, we can create an environment in which all can achieve their full potential.

HONOR CODE STATEMENT
Honor System and Code: The Honor System and Code adopted by George Mason University will be enforced for this class: http://oai.gmu.edu/the-mason-honor-code/

In your work on all written assignments, keep in mind that you may not present as your own the words, the work, or the opinions of someone else without proper acknowledgement. You also may not borrow the sequence of ideas, the arrangement of material, or the pattern of thought of someone else without proper acknowledgement. Please note: Faculty are obligated to submit any Honor Code violations or suspected violations to the Honor Committee without exception.

The appropriate version of the School of Business “Recommendations for Honor Code Violations” should be attached.

BUSINESS LIBRARY LIAISON INFORMATION
Jo Ann J. Henson, MLIS Business and Economics Liaison Librarian
Fenwick Library Fairfax Campus: http://infoguides.gmu.edu/business

DISABILITY
If you have a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 703-993-2474. All academic accommodations must be arranged through the ODS. Please take care of this during the first two weeks of the semester. More information about ODS is available at http://www.gmu.edu/student/drc
RELIGION
Students who will miss class for religious reasons should inform me of their anticipated absences as soon as possible.

COUNSELING CENTER
George Mason University has a counseling center that can provide assistance if you find yourself overwhelmed by life, want training in academic or life skills, or the like. More information is available at http://www.gmu.edu/departments/csdcc/.

WRITING ASSIGNMENT STANDARDS
All writing assignments should be formatted as follows: double-spaced, Times New Roman, 12-point font, and 1-inch margins. To cite and reference professional or academic sources, please use APA style. Specific instructions for in-text citations and referencing are found in the Publication Manual of the American Psychological Association, 6th Edition or at http://owl.english.purdue.edu/owl/resource/560/01/.

To help manage the citations and seamlessly create reference lists, Mason supports a free software called Zotero. Please go to https://www.zotero.org/. This program offers:

- Centralized bibliography management
- Ability to sync across computers
- Ability for teams to combine contributions to the references
- Word plug-in that allows citation management within MS word

George Mason University has a writing center that can help you improve your English writing skills. More information is available at http://writingcenter.gmu.edu/

INCLEMENT WEATHER AND CAMPUS EMERGENCIES
Information regarding weather related changes in the University’s schedule (e.g., closing or late opening) will be provided on the GMU website and via MasonAlert. Students sign up for the Mason Alert system to provide emergency information of various sorts at https://alert.gmu.edu.

An emergency poster exists in each classroom explaining what to do in the event of crises and that further information about emergency procedures exists on http://www.gmu.edu/service/cert.