O ce. Economics Building 105

Meetings. Tuesdays and Thursdays 12:30 PM - 1:45 PM at Muenzinger E417.

O ce hours. Thursdays 2:00 PM - 3:30 PM and by appointment. For appointment send an email to carlos.martins@colorado.edu.

Prerequisites. Successful completion of ECON 3818 or equivalent is a required pre-requisite. ECON 4818 is desirable but by no means necessary.

Objectives. Introduce statistical models, estimation and testing procedures used in analyzing nancial data.

Class URL. http://spot.colorado.edu/~martinsc/ECON_4858.html

Grades. Grades (A-F) will be based on the following:

- There will be ve sets of homework questions whose answers will be graded. Each set accounts for 7 percent of your course grade. Some of these questions will involve the use of MATLAB, a software that is freely available on campus.

- There will be two midterms. Each accounts for 20 percent of your course grade.

- There will be a nal examination which accounts for 25 percent of your course grade.

Dates for the examinations:

Examination	Date and time
Midterm 1	09.28 from 12:30 PM - 1:45 PM
Midterm 2	11.02 from 12:30 PM - 1:45 PM
Final Examination	12.11 from 7:30 PM - 10:00 PM

Homework sets will be available on the class web site with their respective due dates.

Textbook.

1. Ruppert, D., 2004, Statistics and Finance: An Introduction. Springer, New York.

Additional reading.

1. Bernstein, P., 2005, Capital Ideas: The Improbable Origins of Modern Wall Street. John Wiley and Sons, New York. This book gives an informal and historical account of the development of many of the models we treat in class. Great reading for all students in this course.

2. Campbell, J., Lo, A., and MacKinlay, A. C., 1997, The Econometrics of Financial Markets. Princeton University Press, Princeton, New Jersey. This is an advanced textbook, normally used in graduate courses. Its study is recommended for those that have taken more advanced courses in probability, statistics and econometrics and are looking for a deeper understanding of what we discuss in class.

3. Hanselman, D. and Little eld, B., 2005, Mastering MATLAB 7. Pearson, Upper Saddle River, New Jersey. This is one of many step-by-step manuals/guide to MATLAB that are commercially available. It is very easy to read and provides speedy access to the many resources this software o ers.

Topics.

All readings are from the textbook and class notes.

1. Probability and Statistical Models (9 hours)

   Random variables

   Distribution functions, Cumulative distribution functions

   Quantiles

   Moments

   Order statistics

   Skewness, kurtosis and heavy tail distributions

   Multivariate distributions, marginals and conditional distributions

   Prediction

   Estimation - maximum likelihood, least squares

   Hypothesis testing and con dence intervals

2. Returns (3 hours)

   The random walk model

   The e cient market hypothesis

3. Time Series Models (5 hours)

   Stationarity

   Autoregressive AR(p) models and estimation

   Moving average models MA(q) and estimation

   ARMA/ARIMA models

   Model selection: Akaike's information criterion (AIC) and Bayesian information criterion (BIC)

   Forecasting

4. Portfolio theory (2 hours)

   Trading o expected return and risk

5. Regression (8 hours)

   Least squares estimation

   Regression and best linear prediction

   Non-normality and data transformations

6. The capital asset pricing model (4 hours)

       Capital market line, security market line

       Security characteristic line

       Using CAPM in portfolio analysis

       Factor models

7. Options pricing (6 hours)

       Call options

       The law of one price

       Pricing calls

       Martingales

       The Black-Scholes model, formula and its use

       Puts

       Evolution of option prices

       Leverage of options and hedging

8. Fixed income securities (4 hours)

       Zero-coupon bonds, coupon bonds

       Yield to maturity

       Term structure

       Continuous compounding

       Continuous forward rates

       Sensitivity of price to yield

9. GARCH Models (4 hours)

Important information.

- If you qualify for accommodations because of a disability, please submit to me a letter from Disability Services in a timely manner so that your needs may be addressed. Disability Services determines accommodations based on documented disabilities. Contact: 303-492-8671, Willard 322, and

  www.colorado.edu/disabilityservices.

- Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, if the two midterm, final or homework due dates prevent/inhibit you from exercising your rights to religious observance, please inform me by August 28, 2009 so that reasonable accommodations can be made. See full details at www.colorado.edu/policies/fac_relig.html

- Students and faculty each have responsibility for maintaining an appropriate learning environment. Students

courtesy and sensitivity are especially important with respect to individuals and topics dealing with di erences of race, culture, religion, politics, sexual orientation, gender variance, and nationalities. See polices at