**UNIVERSITY OF COLORADO AT DENVER**

**Finance 6290 Professor John Byrd**

Quantitative Methods for Finance john.byrd@ucdenver.edu

Spring 2022 Phone: 970-247-9182

 (before 9:00 pm)

**Course Description:**

This course provides statistical foundation for subsequent courses in the Master of Science in Finance program. Major topics include descriptive statistics, statistical estimation and inference, and linear and “nonlinear” regression analysis. The emphasis is on finance applications, such as investment, risk measurement, portfolio diversification, asset pricing model tests, and corporate theory tests. In addition, students develop competence in the use of statistical software packages. This course provides preparation for the statistical portions of the Certified Financial Analyst professional examinations.

**Textbooks:**

Holmes, Illowsky and Dean, Introductory Business Statistics, Rice University 2018.

Available for free at: <https://openstax.org/details/books/introductory-business-statistics>

You can also order a print copy for $33.50 from Amazon

Jim Frost, Regression Analysis: An Intuitive Guide to Using and Interpreting Linear Models, 2019. Purchase the ebook for $14 at <https://statisticsbyjim.com>

A paperback version can be purchased at Amazon.

**Statistical Software:**

We'll use Excel in this class. Statistics packages simplify doing things like running different regression models quickly. Excel can be awkward when doing complicated regression analysis, but it works and it is available everywhere. Becoming fluent in Excel is important for all business students.

If you want to use a statistical package I suggest STATA (because I know it fairly well and might be able help you). Students can purchase Stata with different licenses through GradPlan (https://www.stata.com/order/new/edu/gradplans/student-pricing/). Stata/IC with a six-month license costs about $50. I would hold off buying it until we get started on regression.

Optional (If you choose to use Stata)

 **Hamilton, Statistics with Stata** (any version from 8 on will be fine) Online booksellers had some for about $6.00 or $8.00. I think it simplifies using STATA a lot.

**Important University dates**

* Last day to drop without $100 course penalty – January 24.
* Last day to drop with tuition adjustment – February 2.
* Last day to drop using UCDAccess or request No Credit or Pass/Fail grade – April 3.

**Course Design**

The class covers seven topics:

* Descriptive statistics
* Confidence intervals
* Hypothesis testing
* OLS regression
* Regression using dummy variables including piecewise regressions
* Transforming data
* Residual analysis
* Forecasting seasonal time-series data

Each topic or pairs of topics will be introduced with one or more online lectures. The following week there will be an application project for the topic. Most topics will have a short (10 point) quiz. For the final assignment you can choose to do either a project or an exam. Projects have to be approved by April 27. Guidelines will be provided in early April. The final exam will be comprehensive; it will cover material from the entire class

**GRADING**

Grades will be determined based on the points each students earns from the following total:

|  |  |
| --- | --- |
| Graded Item | Points |
| 5 short quizzes @ 10 points each | 50 |
| 8 applications projects/cases @ 50 points each | 400 |
| Final exam (due May 11th) | 100 |
| Final project (due May 13th) | 100 |
| TOTAL  | 650 |

Graduate School of Business policy indicates that the average GPA for this class should be between 3.3 and 3.6. Historically, I give high grades, so tend to push the high end of the recommended GPA range. Usually an A letter grade requires earning about 94% of the points; an A- about 90%; a B+ about 86%, etc.

**WORKLOAD**

Classes in the business school require a workload in and out of class that is consistent with the amount of academic credit granted for the course. For a three-semester hour graduate course, it is expected that the workload is, on average, 100-130 hours per term. This will naturally vary somewhat from student to student.

**ACADEMIC HONESTY**

All written work submitted in this course is required to be the work solely of the person or persons whose names appear on the cover sheet. You may discuss the case with classmates but must not share analytic solutions. It defeats the purpose of the class if students don’t complete their own analyses. The individual case reports submitted for a grade must be entirely your work. You are not to make use of previous students' solutions to the cases.

**STUDENTS WITH DISABILITIES**

This syllabus and all other course materials are available in alternative formats on request. Additional services may also be available through the Office of Disability Services (303-556-3450). To request materials in alternative formats, or to discuss any concern you may have about participation in this course, please get in touch with the instructor.

**INCOMPLETES**

An ‘I’ or incomplete grade only applies to cases in which the student has completed substantially all of the work for the course, but is unable to complete the remaining course requirements due to documented circumstances clearly beyond the student’s control.

**CLASS SCHEDULE**

This is my current plan. We will see how the timing works and whether we need to adjust things as the class proceeds. IBS = Introductory Business Statistics RA=Regression Analysis

|  |  |  |  |
| --- | --- | --- | --- |
| Week | Date | Topic/Case | Activity |
| 1 | 18-Jan | Descriptive Statistics IBS Ch. 1 & 2 | Quiz #1 closes January 30 |
| 2 | 24-Jan | Distributions & Confidence Intervals IBS Ch. 5-8 | Quiz #2 closes February 6 |
| 3 | 31-Jan | Applying Descriptive Statistics & Confidence Intervals  | Project 1 due February 13 |
| 4 | 7-Feb | Hypothesis Testing IBS Ch. 9, 10 & 11 | Project 2 due February 20 |
| 5 | 14-Feb | More hypothesis tests | Quiz #3 closes February 27 |
| 6 | 21-Feb | Applying Hypothesis Testing  | Projects 3 & 4 due March 6 |
| 7 | 28-Feb | Introduction to Regression Analysis -IBS Ch. 13 & RA pp. 1-60 |  |
| 8 | 7-Mar | Residual Analysis & Regression Diagnostics RA pp. 197-250 | Quiz #4 closes March 20 |
| 9 | 14-Mar | Applying OLS Regression | Project 5 due April 3 |
| 10 | 21-Mar | SPRING BREAK |  |
| 11 | 28-Mar | Categorical Variables in Regression Models RA pp. 60-84 | Project 6 due April 10 |
| 12 | 4-Apr | Data Transformations & Piecewise Regression RA pp. 85 - 126 | Quiz #5 closes April 17 |
| 13 | 11-Apr | Applying Data Transforms & Piecewise Regression | Project 7 due April 24 |
| 14 | 18-Apr | Forecasting with Seasonal Times Series Data |  |
| 15 | 25-Apr | Forecasting and Cash Budgets | Project 8 due May 8 |
| 16 | 2-May | Review |  |
| 17 | 9-May | Final Exam and Final Project due | Exam May 11 Project May 13 |