Economics 4818 is a course in introductory econometrics, designed to provide you with the theoretical tools and practical experience necessary to do applied econometric research. The prerequisite for this course is a previous course in economic statistics such as Economics 3818. The essential background in probability and statistics is reviewed in Chapter 1 of our text. I will also use matrix algebra in some sections of my lectures, but anyone uncomfortable with these methods can rely on the alternative presentations in the textbook.

You will be actively involved with computers in this course. Your text includes a diskett containing a friendly regression package (for the IBM-PC) called HUMMER, and Appendix B in the text explains how to use the program. Also included on the diskett are several data sets described in Appendix C, and you will use these throughout the course to acquire experience with the regression program and to encounter and solve various applied econometric problems. If you have previous experience with another econometric software package, such as TSP, or if you would prefer to learn TSP, you are welcome to do so. TSP is available on the VAX cluster and on the PCs in the Economics Computing Lab. I can help with troubleshooting for TSP, but I will not provide formal instruction on this program.

Even though HUMMER is used with the IBM-PC, you will also be provided with an account on the VAX cluster. One reason for this is to make TSP available for those who wish this option. Another is that we may find it useful to communicate through electronic mail on the VAX. I may send problem sets or assignments to you through the VAX, and you may want to send questions to me if you are having trouble implementing HUMMER or TSP. Finally, there is an extensive database of economic time series (Citibase) which you may want to access for your own econometric projects. I will try to arrange for someone from Computing and Network Services to provide an introduction to the VAX and E-mail during one class session.

Your grade in the course will be based on one midterm exam and a final exam (each counting one-third of your final grade), and an individual applied regression project (also counting one-third). Problems and computing assignments will be given frequently, and completion of these is essential to learning econometrics and, incidentally, doing well on the exams and the project. I will not grade your problem sets, but we will go over these in class and/or during my office hours. I will ask to to turn in some computer assignments, to make sure you are keeping up with that part of the course.

Individual Regression Projects

The applied regression project will hopefully be an interesting and enjoyable experience for each of you. You are free to choose any topic in empirical economics that is amenable to econometric analysis. Ideas for topics may be found in The Review of Economics and Statistics, Applied Economics, and other applied
economics journals. You may also get some ideas from other economics courses, and from examples presented in the text and in lectures.

Although the topic choice is fairly open-ended, I do want to make sure that everyone finds an appropriate topic and does so long before the end-of-term rush. You are therefore required to submit a brief written proposal identifying the topic you will investigate, sketching a tentative model for estimation, providing some theoretical basis for your model, describing hypotheses to be tested and questions to be addressed, and identifying the data sources and some background literature relevant to your project. This can be done in two pages or less. This proposal is due on October 31. You are invited to discuss your ideas with me at any time during the development of your project.

Once we have agreed on a project you should collect the necessary data and proceed with the estimation. In estimating your model there may be several variants you will try (alternative functional forms, differing variable definitions, alternative lag structures, etc.). You will also certainly encounter various econometric problems. An important part of your assignment is to test for the presence of econometric problems (autocorrelation, heteroscedasticity, multicollinearity, etc.) and to deal with these problems using procedures you will learn in the course. The evaluation of your project will reflect, in part, your skill in handling these econometric problems, and your use and interpretation of variants of your basic model. Which variations, for example, are most convincing in terms of consistency with the underlying theory and absence of econometric problems?

When you have completed your estimation, you should prepare your final report following the format of empirical articles in economics journals. Typically these papers include the following:

1. Introductory overview of the research question; statement of objectives.
2. Presentation of theory and review of relevant theoretical literature.
3. Discussion of previous empirical work in the area; critique and explanation of why your work is vastly superior, or at least different.
4. Specification of your model(s) to be estimated; variable definitions and description of data sources.
5. Presentation of results: estimated equations and summary statistics; results of tests of econometric problems and description of corrective actions taken; results of statistical tests of hypotheses; comparison with other studies.
6. Conclusion; implications of your results for theory and policy; suggestions for further research (now that I have done all this work, this is how I would do it right).

Your final paper is due on the last day of our class, December 10. Include with your written paper the computer printouts of your most important results. Late papers will be penalized by 5 percentage points if I receive it before I must post grades, and by 15 percentage points if it is any later.
Readings and Assignments

The following reading assignments are from the text:
Computer assignments given below refer to the use of HUMMER. You may complete the same assignment with use of TSP or another econometrics program.

I. Introduction to regression and to HUMMER.
   Reading: Appendix B, pp. 377-396.
   Computer assignment: Execute and submit output from tutorial programs 1 and 2 on page 394. Due 9/5.

II. Statistics Review
   Reading: Chapter 1.

III. Least squares and the classical model; alternative functional forms; multicollinearity and specification error.
   Reading: Chapters 2 and 3.
   Computer assignment: Do exercises 2.8 - 2.11 on pages 130-131.

IV. Hypothesis testing; dummy variables.
   Reading: Chapters 4 and 5.
   Computer assignment: Exercises 4.15-4.17 on page 206, and 5.10 on page 245.

Midterm Examination: October 22.

V. Problems of regression: errors in variables, heteroscedasticity, sample selection bias, autocorrelation, spurious regressions.
   Reading: Chapter 6, Chapter 7, pp. 285-301.
   Computer assignment: Exercises 6.8 and 6.9 on page 284.

VI. Extensions of the regression model: distributed lags, causality testing, logit models, seemingly unrelated regressions, simultaneous equations.
   Reading: Chapter 7, pp. 301-326, Chapter 8.
   Computer assignment: Exercises 7.14, 7.16, 7.17 on page 327.

Final Examination: December 13, 7:30 p.m.