OBJECTIVES OF THE COURSE:
This course has two broad objectives: 1. To provide you with the background on various approaches for "doing science" within economics, i.e., the different ways in which knowledge in economics can be expanded. 2. To provide you with practical skills to carry out research in economics. A majority of the course will emphasize this second purpose with the specific objectives of developing your ability to take a general problem or issue, and operationalize it into a researchable hypothesis or model. To this end, the term project is an opportunity to develop your thesis or dissertation prospectus. Further, this course will develop your ability to design data collection efforts (e.g., surveys) that allow implementation or testing of a model. The course will allow you to see how economic theory is used with econometrics and other quantitative methods to test hypotheses and perform economic analyses.

EXAMS, PROJECT, EXERCISES and GRADING: There will be 2 mid-term examinations and a comprehensive final examination. There will also be a term project in which you will be required to select a researchable problem, develop a testable hypothesis or behavioral model, and then design a data collection approach (i.e., identify existing data sources that can be assembled together or design a survey or questionnaire, but not actually administer it) that would enable you to collect the necessary data. You must propose your problem statement, formal hypothesis and model (including variable definitions, relationship between variables), in writing, by October 10th. The final report must be turned in during class on December 5th. You can treat the term project as a draft of a real or practice thesis or dissertation prospectus. More details on this term project will be provided later in a separate handout.

The mid-term exams will count for 40% of your grade, the class project will count for 20% of your grade, with the final accounting for 30%. There will be a few take-home exercises totaling 10% of your grade. There will also be some exercises that carry no credit.

<table>
<thead>
<tr>
<th>Milestones</th>
<th>Dates</th>
<th>% of Final Grade</th>
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<tbody>
<tr>
<td>Exercise #1 Data Analysis</td>
<td>TBA</td>
<td>3%</td>
</tr>
<tr>
<td>Midterm #1</td>
<td>tentatively 9-24</td>
<td>20%</td>
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<tr>
<td>Exercise #2 Project Description</td>
<td>Oct 10th</td>
<td>5%</td>
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<tr>
<td>Midterm #2</td>
<td>tentatively 11-7</td>
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<tr>
<td>Exercise #3 Question Ordering</td>
<td>TBA</td>
<td>2%</td>
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<tr>
<td>Term Project</td>
<td>December 5th</td>
<td>20%</td>
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<tr>
<td>Final Exam</td>
<td>As Sch’d by CSU</td>
<td>30%</td>
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CLASS OUTLINE AND READINGS

I. RESEARCH METHODOLOGY

Lecture 1: Discussion of Course Outline
   What is Research Methodology:
   A Search for Universal Truths or Practical Problem Solving?
   Applying the Scientific Method to the Economics
   Overview of Modes of Data Collection in Economic Analysis
   Introduction to Philosophy of Science

READINGS covered in Lecture 1: Pages 4-11 in Bailey;
READINGS to be read prior to Lecture 2: Pages 52-58 in Bailey;
Reader pages 1-8 in Gebremedhin & Tweeten (in Reader).

Lecture 2: Different Scientific Approaches
   Inductive vs Deductive (Grounded vs Classical)
   Popper's Falsification and a Strict Scientific Method

READINGS to be read prior to Lecture 3: Pages 12-27 in Bailey.

Lecture 3: Overview of Steps in a Typical Research Process
   Defining the Research Problem:
   What kind of problems are amenable to scientific investigation?
   The Role of Paradigms in Defining Researchable Topics and Approaches:
   Are Paradigms World Views Allowing New Discoveries or Blinders?

READINGS to be read prior to Lecture 4: Reader pages 9-14 in Gebremedhin & Tweeten;
Reader: Angrist and Pischke, Mostly Harmless Econometrics (2009), Chapter 1, Questions about Questions: Reader

Lecture 4 Lakatos' Research Program and Laudan's Science as Problem Solving

READINGS to be read prior to Lecture 5: Reader: Friedman, Methodology of Positive Economics-in Reader. Hint: This is a long article & be Prepared to Discuss this paper in class!

Lecture 5: Instrumentalism and Friedman's Methodology of Positive Economics
   Role of Assumptions in model building

READINGS for lecture 6: On Farmers Who Solve Equations: R. Levins, Choices (in Reader) plus the comments and responses that follow (also in Reader).
A. Randall: What Practicing Economists Need to Know About Methodology; AJAE (Reader)
Hint: Read these papers carefully and be prepared to discuss them in class!

Lecture 6a & 6b: Synthesis of different schools of thought & pluralistic approaches
READINGS to be read prior to Lecture 7: Chapter 3:40-52 in Bailey

9-24 tentative date for 1st Mid-Term Exam on material covered to date
II. MECHANICS OF PERFORMING RESEARCH

Lecture 7: Constructing Theories and Models
Description, Explanations and Predictions: Role of Theory as a Guide.
Propositions and Hypotheses;
Relationships between Variables: Theory as a guide to causality.
Necessary and sufficient conditions; development of conceptual models.
Spurious Relationships and Intervening Relationships;

Lecture 8: The unit of analysis in research: Time series vs. cross section research approaches
Individual versus aggregate units of observation
Measuring and Operationalizing Variables
Degree of Information and Aggregation in the Level of Measurement
READINGS: Pages 35-38 and 62-66 in Bailey
Small Group Take Home Exercise: Research problem definition, study design & hypothesis tests.

Lecture 9: Small Group presentations of their problem definition, hypotheses, study designs;
Matching Level of Measurement to Statistical Techniques & Test Statistics:
Nominal: Chi-Square, Logit, Probit, Dummy Variables in OLS
Ordinal: Rank Correlation, Ordered Logit/Probit
Interval/Ratio: Parametric Statistics: T-test, ANOVA, OLS
HANDOUT ON SIMPLE HYPOTHESIS TESTING: T-test, ANOVA, Chi-square, Regression

Lecture 10: Using a statistics package to perform hypothesis tests

Lecture 11: Validity and Reliability
Mono Lake Test-Retest Reliability Example
READINGS: Chapter 4:67-77 in Bailey

Exercise #1 Due: Statistics and Hypothesis Testing

Lectures 12: Sample Design in Brief:
Probability Sampling and External Validity,
Considerations of Sample Size
READINGS: Chapter 5 in Bailey and pages 16-18 in Gebremedhin and Tweeten.
III. DATA ACQUISITION: PRIMARY (SURVEYS & INTERVIEWS) VS EXPERIMENTS, QUASI-EXPERIMENTS AND CORRELATIONAL STUDIES (SECONDARY)

Lecture 13: Finding Existing Sources of Data and Models
Document Study, Coding and Meta analysis: Gov Doc’s, Libraries & Other's Data, Data; Library’s JEL EconLit, AgEcon Search, Census, BEA, etc.

Lectures 14 and 15: Experiments: Lab and Field Experiments in Economics

READINGS: Pages 218-228 and 234-239 in Bailey.
Theory, Experiment and Economics by Vernon Smith, 1989; Rebecca Boyce, et al. Am Econ Review (1992). (Be prepared to discuss in class both articles from the Reader)


Lecture 16 Simulations and Games
LP models and Spreadsheets as simulation tools: Principles and Examples
READINGS: Chapter 13 in Bailey

Lecture 17: Agent Based Modeling in Economics.
READINGS: Loomis and Bond, Introduction to Agent Based Modeling.
Agent Based Computational Economics: A Constructive Approach to Economic Theory (Leigh Tesfatsion, Chapter 16 in Reader.

November 7th tentative time of Mid term

Lecture 18: Primary Data Collection: Surveys and Interviews
The Total Design Method
Overview of Components of Survey Design
Principles of Constructing Questionnaires and Surveys
READINGS: Chapter 7 (bottom of 151 to top of 153) in Bailey

Lecture 19: Introducing the Survey to Respondent, Cover Letters, etc.
Question Ordering
Wording of Questions (what type of variables are you trying to measure)
Open-ended versus Closed-ended Questions, Response Format, Pre-testing
READINGS Chapter 6 in Bailey

Lecture 20: Special Requirements of Mail Surveys
The Total Design Method Revisited
READINGS: Chapter 8 (Pages 196-208)

Lecture 21: Special Requirements of Telephone
READINGS: Chapter 7 in Bailey
Lecture 22: Special Requirements of In-Person Interviews
Conclusion of Questionnaire Design and Administration
READINGS: Chapter 8 (Pages 174-to top of 194 and 208-210) in Bailey
EXERCISE #3 on question ordering

Lecture 23: Choosing between Mail, Telephone and In-Person Surveys
Mixed Mode Surveys; Internet Surveys
Combining Different Types of Surveys;
Options on Internet Surveys: Survey Monkey, SSI and Knowledge Networks,
Qualtrics Survey Software
Data coding in brief
READINGS: Chapter 14 (Data coding)

Lecture 24: Presentation of Study Results
Preparing Graphics for Presentations
Preparing Written and Oral Presentations for Different Audiences
Example of Research Study and Presentation of Results
READINGS: Snooze Alarm: Avoiding Powerpoint Perils by Fraidenburg.
Alice Vandermeulen's How to Fabricate an Article (be prepared to discuss this article)
Gebremedhin and Tweeten, pages 25-29

Reminder: TERM PROJECT DUE: December 5th.

Lectures 25-26: Turning that Thesis or dissertation into an article, responding to reviewers and the journal game

Lecture 27: Obtaining grant funding, writing grants, etc.
READINGS: Environmental and Natural Resource Economists, Great Research, and the National Science Foundation by Robert O’Conner (in Reader).

Lecture 28: Ethics in research with emphasis on Human Subjects Compliance
Ethics in Research, Surveys, data sharing, co-authoring, etc.
READINGS: Chapter 18 (Ethics) in Bailey;

Additional topics, catch up
Review for Final, Any Last Questions
Final, As scheduled by the University