

**University of Pennsylvania  
The Wharton School  
WH 150 Evaluating Evidence**

**Instructor**

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**Office hours**

Monday and Tuesday 1:30-3pm

**Course content**

WH 150 provides an introduction to all stages of the research *design* process for business topics including theory building; hypothesis development; choice of data analysis approach and data collection method (e.g., qualitative studies, surveys, laboratory and field experiments, and analysis of archival data); and data preparation (including methods for converting raw data, including qualitative data, into measurable constructs suited to statistical analysis). The course emphasizes the interplay between the nature of the research question/objective, experimental design, and about sampling/data collection methods. The course does not cover methods of data analysis in any detail; it only provides exposure to types of data analysis methods available or commonly used in business research.

**Ten** class sessions are dedicated to discussions of published research papers (or unpublished working papers). The studies are drawn from the ten Wharton departments: Accounting; Business Economics and Public Policy; Finance; Health Care Management; Legal Studies and Business Ethics; Management; Marketing; Operations, Information and Decisions; Real Estate; and Statistics. Students will read each of the ten research examples in advance of an in-class discussion of the study, and evaluate in a written homework assignment, answering questions about general research design issues and/or questions about specific data collection or analysis methods covered in preceding classes.

The examples from the assigned textbook readings discuss research design and data collection from the perspective of a firm that conducts research to inform its internal strategic decision-making process. For example: Will increasing our firm's investment in employee training (or plant assets or IT or marketing or R&D or employee benefits and so on) lead to lower turnover (or higher profits or lower costs or greater sales or higher growth and so on)? The published research papers that we discuss (described above) complement the textbook readings by providing examples of scholarly research that examines similar business questions but informs them through abstract theory or empirical evidence across samples of multiple firms. While the two types of studies may look different, the foundations for designing a study that can provide reliable evidence are the same.

## **Course objectives**

- 1) Develop critical thinking skills. A researcher's goal, particularly in causal research, is to provide the most compelling evidence about a hypothesis. Designing a study that can provide compelling evidence requires logical reasoning.
- 2) Create sophisticated research *consumers*. At a minimum, business students need to be able to digest research and critically evaluate the evidence as it pertains to their business decision. We live in an evidence-based world!
- 3) Prepare students to be research *producers*. The course provides a foundation for understanding how to develop testable research questions that can inform decision-making and how to design a study to test research questions. The course also introduces a variety of tools necessary for students to be able to collect data for research studies and evaluate research findings.

This course is not intended to dig deeply into specific research methods or into the research of a specific discipline. It provides an introduction to design principles that are the foundation for research across business disciplines.

## **Pre-requisites**

Data analysis is at a basic level. The level of exposure to statistics in STAT 100 is sufficient. I will review introductory econometrics in class

## **Expectations**

**Do the required reading prior to class.**

**Be on time and don't leave early.**

**All absences must be notified to me by email a minimum of 24 hours in advance and you need to fill out a course absence form.**

**Do NOT use your cell phone in class. Do NOT use any electronic equipment unless it is specifically for class use.**

**Be a good citizen in class: listen to your classmates and participate in discussions.**

**Pay attention and take notes.**

### **Course materials**

*The Research Methods Knowledge Base, third edition (KB)*

<http://www.socialresearchmethods.net/kb/>

This is a web-based textbook. Permissions are granted for you to use it (free). Hardcopy versions of the textbook are available for you to purchase online. Appendix A contains a mapping between the hardcopy textbook chapter #s and the online version.

Homework assignments and additional reading materials will be available on Canvas.

Non-Wharton students may obtain a Wharton class account for access to Canvas. If you have been enrolled in a section of this course for at least one day, you can apply for a Wharton class account online at:

<http://accounts.wharton.upenn.edu>

The account should work within approximately 20 minutes. If you encounter difficulty using the online application form or gaining access to Canvas, visit Wharton Computing's office, SHDH 114, or call that office at 215-898-8600 (have your PennCard handy).

## **Grading**

Grading will be determined based on a combination of homework assignments and general conceptual homework assignments, as well as class participation. There are no exams.

*Homework assignments (65%):* For ten class sessions, students will read a scholarly research study (published article or working paper) or a set of related studies. The research will be drawn from the topics studied by the ten Wharton departments. We will discuss the research in class. After class, students will complete an *team* homework assignment. The assignments throughout the semester will ask questions that relate to foundational principles that we cover in the first part of the course. Each homework will also ask questions that are specific to recently covered course material. Field-based HW assignments will be due 2-3 days after the class discussion of the study.

The final grade for the field-based HWs is the equally-weighted average of the nine highest scores on the ten available HWs. Students who are unable to attend class for one of the research presentations due to an excused absence will take a “zero” on that assignment and drop it. Students who are able to attend class for all ten sessions with field-based HWs can drop their lowest score.

*Conceptual homework assignments (20%):* There are two mandatory HW assignments on general concepts. The first is a group assignment and the second is an individual assignment. The assignments are equally weighted.

*Participation (15%):* Class participation is based on:

- (1) attendance,
- (2) participation in class discussion, and
- (3) completion of a few minor out of class assignments, such as bringing an example to class.

The class discussion portion of the participation grade (#2 above) is improved by (a) asking questions that reflect preparation for class and (b) generating ideas related to issues that arise during the discussion.

## Appendix A

### Key to readings on the RESEARCH METHODS KNOWLEDGE BASE

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Readings are available at: <http://www.socialresearchmethods.net/kb/index.php>

The LHS menu bar lists the following items.

Home  
Table of Contents  
Navigating  
Foundations  
Sampling  
Measurement  
Design  
Analysis  
Write-Up  
Appendices  
Search

Readings for the course are from the five sections in red (Foundations, Sampling, Measurement, Design, and Analysis).

The following table maps each topic as it is listed on the website to the corresponding chapter numbers in the hardcopy of the textbook. I will refer to the chapter numbers in the assignment schedule.

	Corresponds to:
<b>Foundations</b>	Intro Ch. 1
Language of Research	1.1
Five Big Words	(not in book)
Types of Questions	1.1a
Time in Research	1.1b
Types of Relationships	1.1c
Variables	1.1d
Hypotheses	1.1e
Types of Data	1.1f
Unit of Analysis	1.1g
Two Research Fallacies	1.1h
Philosophy of Research	1.2
Structure of Research	1.2a
Deduction & Induction	1.2b

Positivism & Post-Positivism	1.2c
Introduction to Validity	1.2d
Ethics in Research	1.3
Conceptualizing	1.4
Problem Formulation	1.4a
Concept Mapping	1.4b
Evaluation Research	
Introduction to Evaluation	
The Planning-Evaluation Cycle	
An Evaluation Culture	
<b>Sampling</b>	Intro Ch. 2
External Validity	2.1
Sampling Terminology	2.2
Statistical Terms in Sampling	2.3
Probability Sampling	2.4
Nonprobability Sampling	2.5
<b>Measurement</b>	Intro Part 3
Construct Validity	3.1
Measurement Validity Types	3.1a
Idea of Construct Validity	3.1b
Convergent & Discriminant Validity	3.1c
Threats to Construct Validity	3.1h
The Nomological Network	3.1d
The Multitrait-Multimethod Matrix	3.1e
Pattern Matching for Construct Validity	3.1f
Reliability	3.2
True Score Theory	3.2a
Measurement Error	3.2b
Theory of Reliability	3.2c
Types of Reliability	3.2d
Reliability & Validity	3.2e
Levels of Measurement	3.3
Survey Research	Intro Ch. 4
Types of Surveys	4.3a
Selecting the Survey Method	4.3b
Constructing the Survey	4.1
Types Of Questions	4.1a
Question Content	4.1b
Response Format	4.1c
Question Wording	4.1d
Question Placement	4.1e
Interviews	4.2, 4.2a-d
Plus & Minus of Survey Methods	4.3c

Scaling	5.2
General Issues in Scaling	5.2a
Thurstone Scaling	5.2b
Likert Scaling	5.2c
Guttman Scaling	5.2d
Qualitative Measures	6.1a
The Qualitative Debate	6.1b
Qualitative Data	6.1c
Qualitative Approaches	Chapter 8
Qualitative Methods	6.1d
Qualitative Validity	6.1e
Unobtrusive Measures	6.2
<b>Design</b>	<b>Intro Ch 7</b>
Internal Validity	7.1
Establishing Cause & Effect	7.1a
Single Group Threats	7.1b
Regression to the mean	7.1b
Multiple Group Threats	7.1fc
Social Interaction Threats	7.1d
Introduction to Design	7.2
Types of Designs	7.3
Experimental Design	9.1a
Two-Group Experimental Designs	9.1b
Probabilistic Equivalence	9.1c
Random Selection & Assignment	9.1d
Classifying Experimental Designs	9.2
Factorial Designs	9.3, 9.3a
Factorial Design Variations	9.3b
Randomized Block Designs	9.4
Covariance Designs	9.5
Hybrid Experimental Designs	9.6
Quasi-Experimental Design	Intro Ch. 10
The Nonequivalent Groups Design	10.1
The Regression-Discontinuity Design	10.2
Other Quasi-Experimental Designs	10.3
Relationships Among Pre-Post Designs	11.2
Designing Designs for Research	11.1
Advances in Quasi-Experimentation	11.3
<b>Analysis</b>	

Conclusion Validity	12.1
Threats to Conclusion Validity	12.1a
Improving Conclusion Validity	12.1b
Statistical Power	12.1c
Data Preparation	12.2
Descriptive Statistics	12.3, 12.3a-c
Correlation	12.3d
Inferential Statistics	14.1
The T-Test	14.3a
Dummy Variables	14.2c
General Linear Model	14.2a, 14.2b
Posttest-Only Analysis	14.3a
Factorial Design Analysis	14.3b
Randomized Block Analysis	14.3c
Analysis of Covariance	14.3d
Nonequivalent Groups Analysis	14.4a
Regression-Discontinuity Analysis	14.4b
Regression Point Displacement Analysis	14.4c