

## WH 1508: Evaluating Evidence

### Class Location

JMHH F92, Friday 10:15-1:15 (Sec I), 1:45-4:45 (Sec II)

Instructor: Prof. Daniel Taylor ([dtayl@wharton.upenn.edu](mailto:dtayl@wharton.upenn.edu))  
Office hours: by appointment (SHDH 1312)

Co-Teacher: Bradford Levy ([lynchb@wharton.upenn.edu](mailto:lynchb@wharton.upenn.edu))  
Office hours: by appointment (SHDH 1504)

“WH1508” must be included in the subject of your emails to get a response

### Course Description

WH 150 provides an introduction to all stages of the research process for business topics. In the first third of the course, we discuss theory building, hypothesis development, and research design choices particularly in causal research. In the second third, we discuss surveys, case studies, and fieldwork, and the use of archival databases. In the final third of the course, we introduce data analysis and interpretation, with several applications to contemporaneous business and societal questions.

### Course Overview & Details

WH 1508 introduces all aspects of the scientific process. The course will cover hypothesis development, research design, analysis, and interpretation. **The goal of the class is to teach students basic logic, critical thinking, and research designs skills that will enable students to evaluate evidence *generally*.** Given the current media landscape, polarization, and sensationalism, these skills are a necessity for the next generation of business leaders. A leader cannot be an expert on all topics, but must have a core set of skills that enables them to evaluate evidence on a wide variety of topics even when they have limited subject matter expertise.

The course will teach logic, critical thinking, and research designs skills by applying these concepts to popular claims and academic evidence surrounding pressing business and societal questions. **The course will not teach the answers to these questions, but rather how one could find answers to these questions through experimentation and data analysis.**

The first few classes will teach abstract logic, critical thinking, and research design skills. These skills will then be honed and expanded through application in subsequently classes. Much of the course will require students to design an “ideal experiment” or “ideal data analysis” that they think would answer a particular question and then evaluate how close existing evidence on the topic comes to that ideal (e.g., design an experiment to test whether the introduction of a work-from-home-policy increased productivity).

**The course will use the Socratic Method and the Socratic Circle and rely heavily on student participation.** Students will be asked to reflect and probe their own thinking, and play “Devil’s

Advocate” to their own logic, research designs, and evidence. **Students should expect to engage and participate in evidence-based arguments and counterarguments during class.** Students will be asked to critically evaluate and discuss the research designs and evidence offered on both sides of a popular question (e.g., the efficacy of masks), and to think about what evidence would be necessary for them to change their positions.

In certain classes employing the Socratic Circle, students will be assigned to one of three groups: (i) a group advocating existing evidence in favor of one view on a question, (ii) a group advocating evidence of an opposing view, and (iii) a “neutral” outside group that will critique the evidence and research designs offered by the first two groups and suggest experiments and data analysis that would resolve the question.

A necessary precondition for the Socratic Method, is that students should approach this class with an open mind, and **students should be prepared to critique and challenge evidence in a neutral and unbiased fashion—regardless of their own personal beliefs.** Students should be engaged, be prepared to participate, and be prepared to be cold-called.

This course is not intended to dig deeply into specific research methods, or specific topical areas. It introduces scientific principles and research design skills that are the foundation for research across disciplines. By the end of class students should be sophisticated research consumers, and begin transitioning to research producers.

#### Pre-requisites

The level of exposure to statistics in AP Statistics, and/or STAT 100 is sufficient. Students will need working knowledge of means, medians, correlations, linear regression, *t*-statistics, and *p*-values.

#### Programming/Software

Students will be asked to analyze datasets. All analysis can be done within MS Excel or similar. Basic Excel commands used to analyze data (estimate difference in means, estimate regressions, etc.) will be taught in class. Equivalent commands in other software will not be covered.

#### Course Material

All course materials are located on the course Canvas site. This site includes all readings, cases, PowerPoint slides, and assignments on each topic. There is no conventional textbook for this course. Instead, a set of notes, readings, and slide decks will be provided.

We will occasionally use and reference: *The Research Methods Knowledge Base, third edition* <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. For students who are interested in a more advanced treatment of the material, *Causal Inference: The Mixtape* <https://mixtape.scunning.com/> offers a fun introduction to the research methods used in business disciplines to draw inferences about cause and effect.

## Attendance

Attendance at all classes is required. Only faculty instructors can excuse an absence. Each unexcused absence will reduce your final grade by 5 pts.

## Grading

Your course grade will be determined as follows:

Class Participation	30%
Individual Assignments	40%
Team Assignments	30%

There will be no curve in the class.

*Participation:* This classes uses the Socratic Method. Preparation and participation is key to the success of this method. You will be graded on the extent of your engagement and preparation for each class. We will keep records of participation during each class. You may request to view your current participation score at the end of each month. **Attendance is required** and does not feature into the participation score. **If you attend class but never participate beyond your required presentations, you will receive a zero for class participation.**

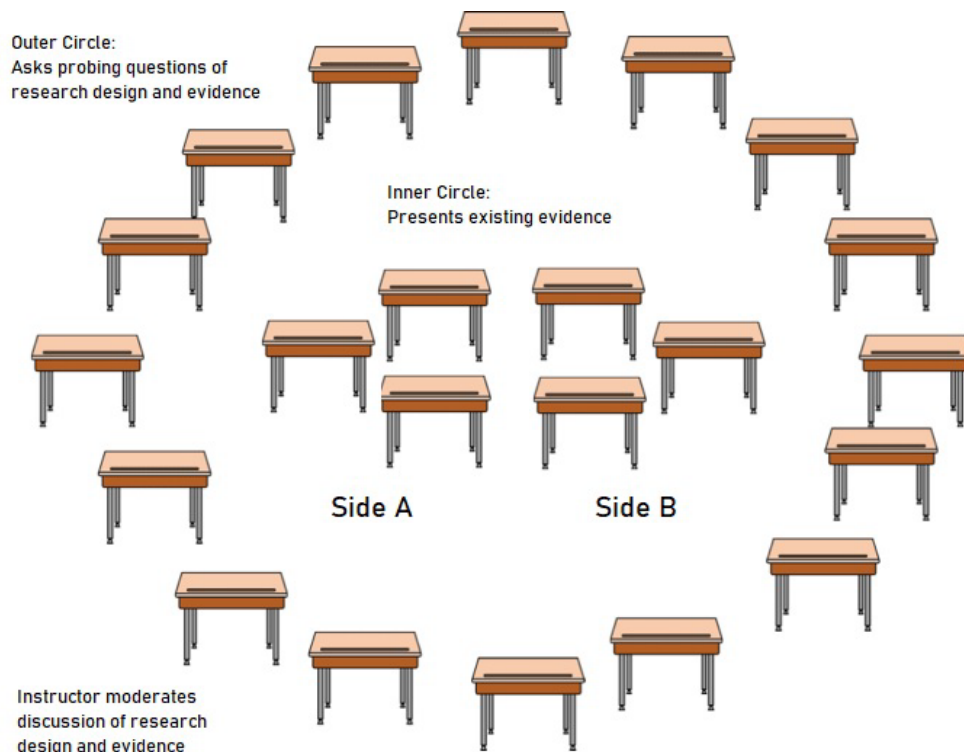
*Individual Assignments:* These assignments will take the form of a homework assignment related to the material that will be covered in the next class. All individual assignments are to be submitted on Canvas by midnight before class.

*Team Assignments:* You will assign yourselves to teams of three on the first day of class. Team assignments take two forms: (1) at least two Socratic circle presentations and (2) a final group presentation on a question of your choosing. For the two Socratic circle presentations, teams will select topics from the Topic Schedule below. In preparation for the presentations, teams must: (1) meet with the instructors who will provide some initial material on the topic to get you started on your own preparation, and (2) provide the class with material (links, studies, media articles, papers) that supports their assigned view on the topic.

Supporting material is due Monday prior to the presentation. Providing the material by the Monday before the presentation ensures that the rest of the class will have sufficient time to review the material.

## Socratic Circle

Your team will be assigned/choose from among a set of business/societal questions to present to the class. Each question has (at least) two sides. Your team will present existing evidence on one side. Another team will present existing evidence on the other side. The two teams are the “inner circle.” The remaining students in class are the “outer circle,” and will critique the research designs and evidence of the two sides. The instructor will moderate and ensure that class discussion revolves around what sort of experiment or data analysis could prove definitive and resolve key differences. Classes utilizing the Socratic Circle are indicated as such on the course schedule with the indicia “SC.”



### Final Team Project

The final team project will follow the same format as the Socratic Circle classes. In contrast to the earlier sessions covering faculty-selected topics, your team will select any pressing business or societal question of particular interest to you, review existing research designs, and present evidence in favor of one answer to the question. Another team will choose to present evidence against the answer. The rest of the class will ask probing questions about the evidence. Presentations will be the final *two* days of class. Each Socratic Circle will be 40 mins long.

*Grading disputes:* All grading disputes must be appealed within one week following the return of the assignment. To have an individual assignment re-graded, please submit a written description of your disagreement. I reserve the right to review the entire assignment; thus your grade could go up *or* down.

## Topic and Assignment Schedule

### **09/02 Class #1. Course Introduction**

- Discuss course structure and organization
- Discuss software and prerequisites
- Form student teams
- Choose “student choice” topic and Socratic Circle topics

### **09/09 Class #2. Review of Basic Statistics and Hypothesis Tests**

- Mean, standard deviation, testing for differences in means, sample size
- Origin of Experiments: Ronald Fisher and the effects of fertilizer on plant growth

### **09/16 Class #3. Basic Experiments and Concepts I**

- Lab: Elevators vs Escalators

### **09/23 Class #4. Basic Experiments and Concepts II**

- Hierarchy of Evidence
- Bias in Observational Studies: Omitted variables, selection, and survivorship

### **09/30 Class #5. Application to the Classics: Cholera and Smoking**

- Introduction to non-experimental approaches
- Inference to the best possible explanation

### **10/07 No Class: Fall Break**

### **10/14 Class #6. Researcher Incentives and *p*-hacking**

- The market for academics
- SEC Economic Analyses
- Experts Witness
- Sponsored Research, e.g., Telecom Industry, Uber, and Robinhood

### **10/21 Class #7. Application to Evidence on the Work from Home Debate (SC)**

### **10/28 Class #8. Application to Evidence on the Payment for Order Flow Debate (SC)**

### **11/04 Class #9. Application to Evidence on the Inflation Debate (SC)**

### **11/11 Class #10. Application to Evidence on the Efficacy of Masks (SC)**

### **11/18 Class #11. Application to Evidence on Covid Vaccines (SC)**

### **11/23 Class #12. Application to Evidence on Climate Change (SC)**

### **12/02 Class #13. Student’s Choice: Final Team Project (SC)**

### **12/09 Class #14. Student’s Choice: Final Team Project (SC)**