



PUBH 6035

Applied Research Methods
Fall 2019

COURSE & CONTACT INFORMATION

Credits: 3
Meeting Day(s): Tuesday and Thursday
Meeting Time: Lecture: Tuesday 1:25 to 3:20
Meeting Place: Lecture: Mayo A110
Meeting Time: Lab: Thursday 1:25 to 2:15 (Section 2) OR Thursday 2:30 to 3:20 (Section 3)
Meeting Place: Lab: Mayo C381

Instructor: Darin Erickson
Email: erick232@umn.edu
Office Phone: 612-626-0516
Fax: 612-624-0315
Office Hours: by appointment
Office Location: WBOB 375
TA: Adrita Rahman (rahma139@umn.edu)

COURSE DESCRIPTION

The purpose of this course is to teach basic research skills and concepts needed to plan, conduct, and analyze data from a research project. Skills including performing literature searches, questionnaire development, scale construction, data cleaning and management, data manipulation and analysis, and interpretation and report writing will be taught. Students will use survey and statistical software throughout the course, and the lab will specifically focus on hands-on activities. The final project will involve proposing a research question, finding and analyzing data to evaluate this question, and writing a report.

Acknowledgments

The contents of PubH 6035 have been developed with the contributions of numerous instructors. Dr. Erickson, the current instructor, has been involved with the majority of recent content and modifications. Former faculty/instructors, including Dr. Deborah Henrikus and Dr. Simone French, had roles in the conceptual development and actual content of the current course, and are acknowledged for their contributions.

COURSE PREREQUISITES

This course is designed primarily for graduate students in Community Health Promotion, Maternal Child Health and Public Health Nutrition who have completed the required biostatistics courses. Program Evaluation for Community Health Education (PubH 6034) is a strongly recommended course prerequisite/companion course. Students in other graduate programs may enroll as space permits.

COURSE GOALS & OBJECTIVES

After completing the course, the student will be able to:

- 1) Search the literature and identify existing project-relevant research.
- 2) Form a research question with testable hypotheses and design a study to evaluate that research question.
- 3) Select appropriate items to construct a research questionnaire and to develop scales.

- 4) Understand the concepts of reliability, validity, response biases, and the pros and cons of a variety of survey administration techniques.
- 5) Conduct data coding, cleaning and descriptive statistics using a computer software package.
- 6) Understand Human Subjects concerns and IRB applications.
- 7) Write a research report summarizing the study purpose, design and methods, and results.

METHODS OF INSTRUCTION AND WORK EXPECTATIONS

Course Workload Expectations

Applied Research Methods is a 3 credit course. The University expects that for each credit, you will spend a minimum of three hours per week attending class or comparable online activity, reading, studying, completing assignments, etc. over the course of a 15-week term. Thus, this course requires approximately 135 hours of effort spread over the course of the term in order to earn an average grade.

Learning Community

School of Public Health courses ask students to discuss frameworks, theory, policy, and more, often in the context of past and current events and policy debates. Many of our courses also ask students to work in teams or discussion groups. We do not come to our courses with identical backgrounds and experiences and building on what we already know about collaborating, listening, and engaging is critical to successful professional, academic, and scientific engagement with topics.

In this course, students are expected to engage with each other in respectful and thoughtful ways.

In group work, this can mean:

- Setting expectations with your groups about communication and response time during the first week of the semester (or as soon as groups are assigned) and contacting the TA or instructor if scheduling problems cannot be overcome.
- Setting clear deadlines and holding yourself and each other accountable.
- Determining the roles group members need to fulfill to successfully complete the project on time.
- Developing a rapport prior to beginning the project (what prior experience are you bringing to the project, what are your strengths as they apply to the project, what do you like to work on?)

In group discussion, this can mean:

- Respecting the identities and experiences of your classmates.
- Avoid broad statements and generalizations. Group discussions are another form of academic communication and responses to instructor questions in a group discussion are evaluated. Apply the same rigor to crafting discussion posts as you would for a paper.
- Consider your tone and language, especially when communicating in text format, as the lack of other cues can lead to misinterpretation.

Like other work in the course, all student to student communication is covered by the Student Conduct Code (<https://z.umn.edu/studentconduct>).

COURSE TEXT & READINGS

The textbook for the course is Research Methods in Health Promotion (2nd Edition) by Salazar, Crosby and DiClemente. The ISBN-10 for the paperback version is 111840906X. Supplemental and Optional Readings will also be available on the class website.

We will use Stata for data analysis in both class and in labs. Stata is on all computers in our laboratory classroom (Mayo C381), on all computers in the SPHere, and on at least two of the computers in the student lounge in WBOB (466). Stata is also available in a number of computer labs across campus - I will provide an up-to-date list of the computer labs on campus that I believe have at least one computer with Stata.

Although not required, you may want to install Stata on your computer. As a student, you can purchase a 6-month license for Stata/IC (which is sufficient for this class) directly from Stata for \$45.

There are very good web resources for using Stata. I highly recommend the UCLA site (<http://www.ats.ucla.edu/stat/stata/>), and the Stata webpage has extensive support and documentation (<https://www.stata.com/support/>). Stata also has a Youtube channel with short (1-5 minute), focused videos that I find very helpful.

COURSE OUTLINE/WEEKLY SCHEDULE

Week	Topic	Readings	Concepts
Week 1 Sep 3	<ul style="list-style-type: none"> Introduction, Research Question and Ethics 	<ul style="list-style-type: none"> Chapter 1-3 	Definitions Learning Objectives Needs Assessment Literature Review Research question Hypotheses Ethics IRB/ HIPAA
Week 2 Sep 10	<ul style="list-style-type: none"> Study Designs 	<ul style="list-style-type: none"> Chapters 4 & 5 	<u>Observational:</u> Exploratory/Descriptive/Analytic Cross-sectional studies Longitudinal studies Case-Control <u>Experimental:</u> Randomization Threats to Validity RCTs Repeated Measures Quasi-experimental designs
Week 3 Sep 17	<ul style="list-style-type: none"> Sampling 	<ul style="list-style-type: none"> Chapter 6 	Population Sample Recruitment Response Rate
Week 4 Sep 24	<ul style="list-style-type: none"> Measurement 	<ul style="list-style-type: none"> Chapter 7 	Metrics Scales vs Indexes Reliability and Validity
Week 5 Oct 1	<ul style="list-style-type: none"> Data Collection 	<ul style="list-style-type: none"> Chapter 9 	Types of data (archival, observation, survey, assay) Recruitment Response bias Attrition

Week 6 Oct 8	<ul style="list-style-type: none"> Implementing Research 	<ul style="list-style-type: none"> Chapters 10, 11 & 13 	<p><u>RCT</u>: Registering, Randomizing, Comparisons, Fidelity</p> <p><u>CBPR</u>: CABs, collaboration, logic model, translation</p> <p><u>Surveys</u>: Sampling frame, modality, sample size, MOP, response rate, pilot testing, weighting</p>
Week 7 Oct 15	<ul style="list-style-type: none"> Descriptive Analyses 	<ul style="list-style-type: none"> Chapter 14 	<p>Probability Theory p-values Distributions Standard Deviation Standard Error</p>
Week 8 Oct 22	<ul style="list-style-type: none"> Bivariate Statistics 	<ul style="list-style-type: none"> 	<p>Cross-tabulations Chi-square test t-test Correlation Significance Power</p>
Week 9 Oct 29	<ul style="list-style-type: none"> Modeling 	<ul style="list-style-type: none"> 	<p>Linear Regression Logistic Regression Choosing an appropriate test</p>
Week 10 Nov 5	<ul style="list-style-type: none"> Modeling 	<ul style="list-style-type: none"> 	<p>Confounding Crude vs adjusted effects Power</p>
Week 11 Nov 12	<ul style="list-style-type: none"> Interpretation 	<ul style="list-style-type: none"> Chapter 17 	<p>Measures of Association Predicted Scores</p>
Week 12 Nov 19	<ul style="list-style-type: none"> Moderation and Mediation 	<ul style="list-style-type: none"> 	<p>Interactions Intermediate Outcomes Indirect, Direct, Total Effects</p>
Week 13 Nov 26	<ul style="list-style-type: none"> Pre-Post and Longitudinal 	<ul style="list-style-type: none"> 	<p>Change Scores Repeated Measures Nonindependence Bias Trajectories</p>
Week 14 Dec 3	<ul style="list-style-type: none"> Time Series 	<ul style="list-style-type: none"> 	<p>Interrupted Time Series</p>

SPH AND UNIVERSITY POLICIES & RESOURCES

The School of Public Health maintains up-to-date information about resources available to students, as well as formal course policies, on our website at www.sph.umn.edu/student-policies/. Students are expected to read and understand all policy information available at this link and are encouraged to make use of the resources available.

The University of Minnesota has official policies, including but not limited to the following:

- Grade definitions
- Scholastic dishonesty
- Makeup work for legitimate absences
- Student conduct code
- Sexual harassment, sexual assault, stalking and relationship violence
- Equity, diversity, equal employment opportunity, and affirmative action
- Disability services
- Academic freedom and responsibility

Resources available for students include:

- Confidential mental health services
- Disability accommodations
- Housing and financial instability resources
- Technology help
- Academic support

EVALUATION & GRADING

Grades for this course will be assigned based on total points earned out of 100.

<u>Sources of Points</u>	<u># Assignments x Points</u>	<u>Total Points Possible</u>
Labs	(10) x 6	60
Class Project	(4) x 8	32
Class participation, Quizzes		<u>8</u>
		100

Grading Scale

The University uses plus and minus grading on a 4.000 cumulative grade point scale in accordance with the following, and you can expect the grade lines to be drawn as follows:

% In Class	Grade	GPA
93 - 100%	A	4.000
90 - 92%	A-	3.667
87 - 89%	B+	3.333
83 - 86%	B	3.000
80 - 82%	B-	2.667
77 - 79%	C+	2.333
73 - 76%	C	2.000
70 - 72%	C-	1.667
67 - 69%	D+	1.333
63 - 66%	D	1.000
< 62%	F	

- A = achievement that is outstanding relative to the level necessary to meet course requirements.
- B = achievement that is significantly above the level necessary to meet course requirements.
- C = achievement that meets the course requirements in every respect.
- D = achievement that is worthy of credit even though it fails to meet fully the course requirements.
- F = failure because work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an I (Incomplete).
- S = achievement that is satisfactory, which is equivalent to a C- or better
- N = achievement that is not satisfactory and signifies that the work was either 1) completed but at a level that is not worthy of credit, or 2) not completed and there was no agreement between the instructor and student that the student would receive an I (Incomplete).

Evaluation/Grading Policy	Evaluation/Grading Policy Description
<p>Scholastic Dishonesty, Plagiarism, Cheating, etc.</p>	<p>You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis (As defined in the Student Conduct Code). For additional information, please see https://z.umn.edu/dishonesty</p> <p>The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: https://z.umn.edu/integrity.</p> <p>If you have additional questions, please clarify with your instructor. Your instructor can respond to your specific questions regarding what would constitute scholastic dishonesty in the context of a particular class-e.g., whether collaboration on assignments is permitted, requirements and methods for citing sources, if electronic aids are permitted or prohibited during an exam.</p> <p>Indiana University offers a clear description of plagiarism and an online quiz to check your understanding (http://z.umn.edu/iuplagiarism).</p>
<p>Late Assignments</p>	<p>Assignments must be turned in on time. Points may be deducted for late assignments.</p>
<p>Attendance Requirements</p>	<p>Points are awarded for class attendance and participation. Please inform the instructor before class if attendance is not possible.</p>
<p>Extra Credit</p>	<p>none</p>