



PubH 6035 Applied Research Methods Fall 2017

Credits:	3
Meeting Days:	Tuesday and Thursday
Meeting Time:	1:25 to 2:15 (lecture) 2:30 to 3:30 (lab)
Meeting Place:	Nils Hasselmo Hall 2-101 (lecture) Mayo C381 (lab)
Instructor:	Darin Erickson
Office Address:	375 WBOB
Office Phone:	612-626-0516
Fax:	612-624-0315
E-mail:	erick232@umn.edu
Office Hours:	by appointment
TA:	Collin Calvert (calve054@umn.edu)

I. 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 Hennrikus and Dr. Simone French, had roles in the conceptual development and actual content of the current course, and are acknowledged for their contributions.

II. 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.

III. Course Goals and 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.

IV. Methods of Instruction and Work Expectations

Expectations

Students will be expected to:

- 1) Attend and actively participate in class and required labs.
- 2) Download lab instructions from Moodle before each lab, review the instructions before the lab session, and bring the instructions and other materials required for the lab to the lab session.
- 3) Read assigned materials.
- 4) Complete and turn in homework and lab assignments.
- 5) Provide feedback to other students regarding their projects.
- 6) Complete a final project.

Course Website

There is a course website on Moodle. All homework assignments and class notes will be posted on the website before they will be needed for class. Please download these materials and bring them to class: additional copies will not be handed out in class. Grades for homework assignments will be posted on the website.

Assignments

Assignments must be turned in via the course website on the due date to receive full credit. Each assignment will be introduced and reviewed during class or lab sessions. Statistical analysis assignments will be completed using Stata. It will be possible to analyze data using other statistical software, such as EXCEL, SAS or SPSS, but the instructor and the TA will be able to provide very limited help with programming and advice using some software. If you do want to use software other than Stata to analyze data, please talk with the course instructor.

Labs

The labs in the course will consist of structured tasks that apply concepts covered in lecture and provide hands-on experience with software. The majority of the lab sessions focus on Stata, a statistical software package for data analysis. You should be able to complete your analyses during the lab periods, but computers that have Stata software can be found in the SPHere, the Computing Lab at the Coffman Union and in the student lounge in WBOB. A few of the labs focus on REDCap and Qualtrics, web applications for building surveys and collecting data.

Quizzes

There will be a few brief quizzes conducted on the course website. Each will be worth 2 points. Each quiz must be completed by the due date in order to receive credit. Most will cover information in the assigned readings. The quizzes will be announced in class, but it is very important that you also check the website every week to make sure that you don't miss a quiz.

Final Project

Final projects will be developed and completed over the course of the semester. Steps to be completed include:

- 1) Identify a topic and conduct a literature search.
- 2) Develop a set of research questions and associated scientific hypotheses.
- 3) Identify a dataset appropriate for answering the research questions.
- 4) Conduct data analysis to answer your research question.
- 5) Write a scientific report including an introduction/rationale, methods/analysis, results, and discussion. The final paper should resemble a scientific journal article in structure, style and format. Results presented should include some or all of the following: descriptive statistics (means, standard deviations, frequencies), graphic presentation, reliability and validity, and tests of significance.

The first four steps will be assignments throughout the semester. The final report will be due at the end of the semester. Both class and lab time will be reserved to work on the project.

V. Course Text and 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.

VI. Course Outline/Weekly Schedule

<i>Week</i>	<i>Dates</i>	<i>Topic</i>	<i>Concepts</i>	<i>Readings</i>
1	Sep 5 & 7	Introduction	Definitions Learning Objectives Needs Assessment Literature Review	Chapter 1
2	Sep 12 & 14	Theory, Research Question and Ethics	Theory Research question Hypotheses Ethics IRB HIPAA	Chapters 2 & 3
3	Sep 19 & 21	Designs	<u>Observational:</u> Exploratory/Descriptive/Analytic Cross-sectional studies Longitudinal studies Case-Control	Chapters 4 & 5
4	Sep 26 & 28	Sampling	<u>Experimental:</u> Randomization Threats to Validity RCTs Repeated Measures Quasi-experimental designs	Chapter 6
5	Oct 3 & 5	Measurement	Population Sample Recruitment Response Rate Metrics	Chapter 7
6	Oct 10 & 12	Data Collection	Scales vs Indexes Reliability and Validity	Chapter 9
7 & 8	Oct 17 - 26	Implementing Research	Types of data (archival, observation, survey, assay) Recruitment Response bias Attrition	Chapter 9
9 & 10	Oct 31 – Nov 9	Stats 101/ Descriptive Analyses	<u>RCT:</u> Registering, Randomizing, Comparisons, Fidelity <u>CBPR:</u> CABs, collaboration, logic model, translation <u>Surveys:</u> Sampling frame, modality, sample size, MOP, response rate, pilot testing, weighting	Chapters 10, 11 & 13
11	Nov 14 & 16	Bivariate Statistics	Probability Theory p-values Distributions Standard Deviation Standard Error Cross-tabulations Chi-square test t-test Correlation Significance	Chapter 14

			Power	
12	Nov 21	Modeling	Linear Regression Logistic Regression Choosing an appropriate test Confounding Crude vs adjusted effects Power	
13	Nov 28 & 30	Interpretation	Measures of Association Predicted Scores	Chapter 17
14	Dec 5 & 7	Pre/Post and Longitudinal Data Analysis	Change Scores Repeated Measures Nonindependence Bias	
15	Dec 12	Moderation and Mediation	Interactions Intermediate Outcomes Indirect, Direct, Total Effects	

VII. Evaluation and 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>
Assignments	6 x (points vary)	40
Labs	12 x 2	24
Brief quizzes	3 x 2	6
Class participation		5
Final Project	1 x 25	25
		100

Letter grades are determined as follows:

<u>Grade</u>	<u>Points</u>
A	94-100
A-	90-93
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72

S/N option must complete all assignments to a C- level (70%).

The University utilizes plus and minus grading on a 4.000 cumulative grade point scale in accordance with the following:

A	4.000 - Represents achievement that is outstanding relative to the level necessary to meet course requirements
A-	3.667
B+	3.333

- B 3.000 - Represents achievement that is significantly above the level necessary to meet course requirements
- B- 2.667
- C+ 2.333
- C 2.000 - Represents achievement that meets the course requirements in every respect
- C- 1.667
- D+ 1.333
- D 1.000 - Represents achievement that is worthy of credit even though it fails to meet fully the course requirements
- S Represents achievement that is satisfactory, which is equivalent to a C- or better.

For additional information, please refer to:

<http://policy.umn.edu/Policies/Education/Education/GRADINGTRANSCRIPTS.html>.

Course Evaluation

The SPH will collect student course evaluations electronically using a software system called CourseEval: www.sph.umn.edu/courseval. The system will send email notifications to students when they can access and complete their course evaluations. Students who complete their course evaluations promptly will be able to access their final grades just as soon as the faculty member renders the grade in SPHGrades: www.sph.umn.edu/grades. All students will have access to their final grades through OneStop two weeks after the last day of the semester regardless of whether they completed their course evaluation or not. Student feedback on course content and faculty teaching skills are an important means for improving our work. Please take the time to complete a course evaluation for each of the courses for which you are registered.

Incomplete Contracts

A grade of incomplete "I" shall be assigned at the discretion of the instructor when, due to extraordinary circumstances (e.g., documented illness or hospitalization, death in family, etc.), the student was prevented from completing the work of the course on time. The assignment of an "I" requires that a contract be initiated and completed by the student before the last official day of class, and signed by both the student and instructor. If an incomplete is deemed appropriate by the instructor, the student in consultation with the instructor, will specify the time and manner in which the student will complete course requirements. Extension for completion of the work will not exceed one year (or earlier if designated by the student's college). For more information and to initiate an incomplete contract, students should go to SPHGrades at: www.sph.umn.edu/grades.

University of Minnesota Uniform Grading and Transcript Policy

A link to the policy can be found at onestop.umn.edu.

VIII. Other Course Information and Policies

Grade Option Change (if applicable):

For full-semester courses, students may change their grade option, if applicable, through the second week of the semester. Grade option change deadlines for other terms (i.e. summer and half-semester courses) can be found at onestop.umn.edu.

Course Withdrawal:

Students should refer to the Refund and Drop/Add Deadlines for the particular term at onestop.umn.edu for information and deadlines for withdrawing from a course. As a courtesy, students should notify their instructor and, if applicable, advisor of their intent to withdraw.

Students wishing to withdraw from a course after the noted final deadline for a particular term must contact the School of Public Health Office of Admissions and Student Resources at sph-ssc@umn.edu for further information.

Student Conduct Code:

The University seeks an environment that promotes academic achievement and integrity, that is protective of free inquiry, and that serves the educational mission of the University. Similarly, the University seeks a community that is free from violence, threats, and intimidation; that is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and that does not threaten the physical or mental health or safety of members of the University community.

As a student at the University you are expected adhere to Board of Regents Policy: *Student Conduct Code*. To review the Student Conduct Code, please see:
http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf.

Note that the conduct code specifically addresses disruptive classroom conduct, which means "engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities."

Use of Personal Electronic Devices in the Classroom:

Using personal electronic devices in the classroom setting can hinder instruction and learning, not only for the student using the device but also for other students in the class. To this end, the University establishes the right of each faculty member to determine if and how personal electronic devices are allowed to be used in the classroom. For complete information, please reference:
<http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html>.

Scholastic Dishonesty:

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. (Student Conduct Code:
http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf) If it is determined that a student has cheated, he or she may be given an "F" or an "N" for the course, and may face additional sanctions from the University. For additional information, please see:
<http://policy.umn.edu/Policies/Education/Education/INSTRUCTORRESP.html>.

The Office for Community Standards has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: <https://communitystandards.umn.edu/>. If you have additional questions, please clarify with your instructor for the course. 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.

Makeup Work for Legitimate Absences:

Students will not be penalized for absence during the semester due to unavoidable or legitimate circumstances. Such circumstances include verified illness, participation in intercollegiate athletic events, subpoenas, jury duty, military service, bereavement, and religious observances. Such circumstances do not include voting in local, state, or national elections. For complete information, please see:
<http://policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html>.

Appropriate Student Use of Class Notes and Course Materials:

Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. Such actions violate shared norms and standards of the academic community. For additional information, please see: <http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html>.

Sexual Harassment:

"Sexual harassment" means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature. Such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. Such behavior is not acceptable in the University setting. For additional information, please consult Board of Regents Policy:

<http://regents.umn.edu/sites/default/files/policies/SexHarassment.pdf>

Equity, Diversity, Equal Opportunity, and Affirmative Action:

The University will provide equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy:

http://regents.umn.edu/sites/default/files/policies/Equity_Diversity_EO_AA.pdf.

Disability Accommodations:

The University of Minnesota is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center Student Services is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact DRC at 612-626-1333 or drc@umn.edu to arrange a confidential discussion regarding equitable access and reasonable accommodations.

If you are registered with DS and have a current letter requesting reasonable accommodations, please contact your instructor as early in the semester as possible to discuss how the accommodations will be applied in the course.

For more information, please see the DS website, <https://diversity.umn.edu/disability/>.

Mental Health and Stress Management:

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website: <http://www.mentalhealth.umn.edu>.

The Office of Student Affairs at the University of Minnesota:

The Office for Student Affairs provides services, programs, and facilities that advance student success, inspire students to make life-long positive contributions to society, promote an inclusive environment, and enrich the University of Minnesota community.

Units within the Office for Student Affairs include, the Aurora Center for Advocacy & Education, Boynton Health Service, Central Career Initiatives (CCE, CDes, CFANS), Leadership Education and Development – Undergraduate Programs (LEAD-UP), the Office for Fraternity and Sorority Life, the Office for Community Standards, the Office for Student Engagement, the Parent Program, Recreational Sports, Student and Community Relations, the Student Conflict Resolution Center, the Student Parent HELP Center, Student Unions & Activities, University Counseling & Consulting Services, and University Student Legal Service.

For more information, please see the Office of Student Affairs at <https://osa.umn.edu/>.

Academic Freedom and Responsibility, for courses that involve students in research

Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom and conduct relevant research. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.* When conducting research, pertinent institutional approvals must be obtained and the research must be

consistent with University policies.

Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help. Contact the instructor, the Department Chair, your adviser, the associate dean of the college, (Dr Kristin Anderson, SPH Dean of Student Affairs), or the Vice Provost for Faculty and Academic Affairs in the Office of the Provost.

** Language adapted from the American Association of University Professors "Joint Statement on Rights and Freedoms of Students".*

Student Academic Success Services (SASS): <http://www.sass.umn.edu>:

Students who wish to improve their academic performance may find assistance from Student Academic Support Services. While tutoring and advising are not offered, SASS provides resources such as individual consultations, workshops, and self-help materials.

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