

University of Florida

College of Public Health & Health Professions Syllabus
PHC 6011: Epidemiology Methods II (3 credit hours)
Summer A/C 2016

Delivery Format: On-Campus (HPNP G-210), MW 12:30-4:30PM
Canvas Course Website: <https://lss.at.u.edu/>

Xinguang “Jim” Chen, MD, PhD

Professor, Department of Epidemiology

Office: 2004 Mowry Road, Clinical and Translational Research Building (CTRB) #4228

Phone: (352) 294-5945

Email: jimax.chen@ufl.edu

Office Hours: Wednesdays 10:30-11:30am and by appointment

Teaching Assistant: Dr. Yan Wang (ywang48@phhp.ufl.edu)

Preferred course communications: Email, office hours

Prerequisites

PHC 6000, PHC 6052, and PHC 6053, or instructor permission. Students are required to have applied SAS or R training, and must have access to a laptop with either SAS version 9.2 or higher or R version 3.1.0 or higher for in-class use. This class assumes an advanced competency with epidemiologic principles and vocabulary, in addition to a working knowledge of introductory statistical inference and regression techniques.

Relation to Program Outcomes

This course will facilitate graduate students to apply the most commonly used research designs and analytical methods in practical epidemiological research. It will help students to learn to design their own research and publish their own data. The course also serves as a bridge toward more complex research designs and analytical methods, such as observational longitudinal study, cluster randomization, heterogeneous data analysis, developmental trajectory analysis, mixed and generalized mixed effect modeling, cusp catastrophe modeling, and probabilistic discrete event systems modeling to tackle challenging epidemiological questions.

PURPOSE AND OUTCOME

Course Overview

This course describes the implementation of common analytic methods in epidemiology. A course project helps build a foundation in applied epidemiologic analysis and develop experience in peer-review productivity based on secondary data.

Course Objectives and/or Goals

This course builds upon PHC 6000 (Epidemiology Methods I) to extend the understanding of epidemiologic concepts and methods by providing applied training in the conduct of secondary data analysis studies. Using data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), students will 1) identify a research question; define a causal model, specific aims, and hypotheses based on a review of the literature; 2) gain experience in data management; 3) conduct epidemiologically sound analyses with regard to study design, confounding, and effect modification; and 4) interpret results with respect to the strength and precision of estimates, potential selection and information bias, measurement errors, confounding, and generalizability

Instructional Methods

This course consists of 11 sessions, each of which will last 4.25 hours. Generally each session is divided into two parts: theory and application. Instructor will lecture on theoretical aspect of the epidemiologic methods and brief discuss their statistical underpinnings. In the application sections, instructor will work together with students to explore how the methods are implemented and results interpreted in practice using SAS, R or other software of students' preference. Application sections will also include student presentations at key milestones in the course project. Upon completion of the course project, students will have generated a research question, compiled and analyzed data to address this question, and constructed a manuscript draft that would be approximately suitable for peer-reviewed journal submission.

DESCRIPTION OF COURSE CONTENT

Course Schedule

Session and Date	Topics (♣ = theoretical, ☺ = applied)
May 9, Monday Session I 12:30-4:30pm	<ul style="list-style-type: none"> ♣ Introduction to the course ♣ Designing secondary data analysis studies ♣ Data, variables and graphic causal reasoning ☺ Overview of the Add Health data resource ☺ Form project teams ☺ Loading the Add Health data
May 11, Wednesday Session II 12:30-4:30pm	<ul style="list-style-type: none"> ♣ Understanding the data, choosing a coding structure ♣ Table 1 – sample description ☺ Tabling and visualizing data ☺ Recoding variables ☺ Work on conceptual model
May 16, Monday Session III 12:30-4:30pm	<ul style="list-style-type: none"> ♣ Various regression methods for analysis ♣ Generalized linear models: normal, logistic, and Poisson regression ☺ GLMs in SAS and R
May 18, Wednesday Session IV 12:30-4:30pm	<ul style="list-style-type: none"> ♣ Time-to-event data ♣ Survival models ♣ Cox (proportional hazards) regression model ☺ Time-to-event analyses in SAS and R ☺ <i>Oral presentations of project part 1</i>
May 23, Monday Session V 12:30-4:30pm	<ul style="list-style-type: none"> ♣ Interaction/moderation ♣ Mediation ☺ Interaction and mediation in SAS and R ☺ Written project part 1 due (Title, lit. review, graphic causal, table 1)
May 25, Wednesday Session VI 12:30-4:30pm	<ul style="list-style-type: none"> ♣ Measurement error ♣ Misclassification ♣ Sensitivity analyses ☺ Sensitivity analyses in SAS and R
June 1, Wednesday Session VII 12:30-4:30pm	<ul style="list-style-type: none"> ♣ Model and variable selection ♣ High-dimensional data ♣ Penalized regression ☺ Selection and penalized regression in SAS and R ☺ <i>Oral presentations of project part 2</i>
June 6, Monday Session VIII 12:30-4:30 pm	<ul style="list-style-type: none"> ♣ Missing data ☺ Methods for handling missing data in SAS and R ☺ Written project part 2 due (results and interpretation)
June 8, Wednesday Session IX 12:30-4:45pm	<ul style="list-style-type: none"> ♣ Understand p value for epidemiology ♣ Statistical power ☺ Power analysis using SAS, R and other means
June 13 & 15, M&W Session X & XI 12:30-4:30pm	<ul style="list-style-type: none"> ♣ <i>Final Project presentations and review</i> ☺ Full written projects due by session X

Course Materials and Technology

Throughout the course, we will analyze data from the National Longitudinal Study of Adolescent to Adult Health (Add Health). De-identified, publicly-accessible versions of this data are available through the ICPSR website (www.icpsr.umich.edu). There are 4 waves of data, and each can be found by searching for the term "Add Health" within ICPSR.

IRB considerations are very important, and one must obtain IRB approval for conducting human subjects research. For the purposes of this course only, IRB approval is not required to use the Add Health data, since we are not conducting research for publication purpose; rather, we are simply completing course exercises. If, however, you wish to present your findings anywhere outside this classroom, you will need to apply for an IRB approval through the website (<https://my.irb.u.edu>). A quick approach to apply IRB approval for using Add Health is to ask for an exempt not full panel review; the Add Health data are qualified for exempt because the data are anonymous and in the public domain. All of you are encouraged to apply for IRB exemption for your research question, as this will permit maximum flexibility for presenting your findings. Indeed, I hope that everyone makes an important scientific discovery to share beyond the confines of our classroom!

For all class sessions, students are expected to bring a laptop with either SAS version 9.2 or higher or R version 3.1.0. In my own work, I use SAS more often than other software. SAS is efficient in managing large and complex data while R is free and more flexibly for statistical analysis and visualization. In many cases, if you know one, it is not hard to use another. You are welcome to use whichever pipeline you feel the most efficient to you; the course can successfully be completed entirely with SAS, R, or some mixture of the two.

For technical support for this class, not related to SAS or R programming, please contact the UF Help Desk at:

- ✓ Learning-support@ufl.edu
- ✓ (352) 392-HELP - select option 2
- ✓ <https://lss.at.ufl.edu/help.shtml>

ACADEMIC REQUIREMENTS AND GRADING

Textbooks

- [Required] Woodward M. *Epidemiology: Study Design and Data Analysis* (3rd Ed), CRC Press
 [Recommended] Twisk, J. *Applied Longitudinal Data Analysis for Epidemiology* (2nd Ed), Cambridge
 [Recommended] Jewell N.P. *Statistics for Epidemiology*, CRC
 [Recommended] Agresti A. *Categorical Data Analysis* (3rd Ed), Wiley

Important. Additional article-length readings will be assigned in class as needed.

Assignments and Grading

Requirement	Due date	Points
Focal point quizzes (8 quizzes, 2 grade points each)	In class	16
Oral presentation of project part 1	Presentation day	10
Written Project Part 1: Introduction and table 1	Before presentation	17
Oral presentation of project part 2	Presentation day	10
Written project part 2: Results from analysis	Before presentation	17
Written project part 3: Discussion and abstract	Before presentation	17
Oral presentation of full project	Presentation day	10
Feedback on peers' presentation (4 reviews and 2 points/review)	Presentation day	8

Note that these components sum to 105. The possible point total is set at 100 points. This is done to help you in the event that you need to drop a focal point quiz or miss a section of student presentations as a result of unforeseen attendance issues.

Point System

Point earned	93-100	90-92	87-89	83-86	80-82	77-79	73-76	70-72	67-69	63-66	60-62	<60
Letter grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
Grade points	4.0	3.67	3.33	3.00	2.67	2.33	2.00	1.67	1.33	1.00	0.67	0.00

For greater detail on the meaning of letter grades and university policies related to them, see the Registrar's Grade Policy regulations at: <http://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Exam Policy

Policy Related to Make up Exams or Other Work

Please note: Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported. The ticket number will document the time and date of the problem. You MUST e-mail me within 24 hours of the technical difficulty if you wish to request a make-up.

Policy Related to Required Class Attendance

Class attendance is mandatory. Excused absences follow the criteria of the UF Graduate Catalogue (e.g., illness, serious family emergency, military obligations, religious holidays), and should be communicated to the instructor prior to the missed class day when possible. UF rules require attendance during the first two course sessions. Missing more than two scheduled sessions without excuse (each session is about 4 hours of instruction) will result in a failure. Students are responsible for all material presented in class and meeting the scheduled due dates for class assignments.

All faculty are bound by the UF policy for excused absences. For information regarding the UF Attendance Policy see the Registrar website for additional details:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

STUDENT EXPECTATIONS, ROLES, AND OPPORTUNITIES FOR INPUT

Expectations Regarding Course Behavior

Please come to class on time and be prepared to stay until the time scheduled as the end of class. We think your investment in the degree is worth maximizing your in-class experience, and we expect to provide materials that utilize the full, scheduled class times. The use of cell phones is not permitted. Please turn them off or, if you expect urgent calls, set them to vibrate."

Communication Guidelines

Assistance with course material is available during scheduled office hours or by appointment. Emailed questions are also welcome, and we aim to address all such inquiries within 24 hours of receipt (or on Monday if the email was sent on Friday). Please do not re-send the same question until the appropriate time frame has elapsed (24 hours or end of day Monday for emails sent on Friday). Student success and understanding is of the utmost importance, so each email receives careful consideration. Because the number of students in the course is not small, substantial time may be spent by the instructor and TA on emailed concerns; your patience and understanding is appreciated. When emailing a question, please also copy the TA, as this may increase your chances of getting a quick reply!

Academic Integrity

Students are expected to act in accordance with the University of Florida policy on academic integrity. As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge:

"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."

You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied:

"On my honor, I have neither given nor received unauthorized aid in doing this assignment."

It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For additional information regarding Academic Integrity, please see Student Conduct and Honor Code or the Graduate Student Website for additional details:

<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>

<http://gradschool.ufl.edu/students/introduction.html>

Please remember cheating, lying, misrepresentation, or plagiarism in any form is an unacceptable and inexcusable behavior.

Online Faculty Course Evaluation Process

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

It is very important to me that you are able to develop a set of epidemiologic tools in this course that you will find useful in your career. Naturally, the presentation of some tools may be stronger than others. Your feedback on this issue is extremely valuable. Please feel free to comment on what strategies worked and which might be improved. Your input will be essential for us to modify future versions of this course to leverage such knowledge of strengths and weaknesses. As an additional consideration, these evaluations are also useful at the University level, as they are examined in the context of faculty tenure and promotion procedures.

SUPPORT SERVICES

Accommodations for Students with Disabilities

If you require classroom accommodation because of a disability, you must register with the Dean of Students Office <http://www.dso.ufl.edu> within the first week of class. The Dean of Students Office will provide documentation of accommodations to you, which you then give to me as the instructor of the course to receive accommodations. Please make sure you provide this letter to me by the end of the second week of the course. The College is committed to providing reasonable accommodations to assist students in their coursework.

Counseling and Student Health

Students sometimes experience stress from academic expectations and/or personal and interpersonal issues that may interfere with their academic performance. If you find yourself facing issues that have the potential to or are already negatively affecting your coursework, you are encouraged to talk with an instructor and/or seek help through University resources available to you.

- The Counseling and Wellness Center 352-392-1575 offers a variety of support services such as psychological assessment and intervention and assistance for math and test anxiety. Visit their web site for more information: <http://www.counseling.ufl.edu>. On line and in person assistance is available.
- You Matter We Care website: <http://www.umatter.ufl.edu/>. If you are feeling overwhelmed or stressed, you can reach out for help through the You Matter We Care website, which is staffed by Dean of Students and Counseling Center personnel.
- The Student Health Care Center at Shands is a satellite clinic of the main Student Health Care Center located on Fletcher Drive on campus. Student Health at Shands offers a variety of clinical services. The clinic is located on the second floor of the Dental Tower in the Health Science Center. For more information, contact the clinic at 392-0627 or check out the web site at: <https://shcc.ufl.edu/>
- Crisis intervention is always available 24/7 from:
Alachua County Crisis Center
(352) 264-6789
<http://www.alachuacounty.us/DEPTS/CSS/CRISISCENTER/Pages/CrisisCenter.aspx>

Do not wait until you reach a crisis to come in and talk with us. We have helped many students through stressful situations impacting their academic performance. You are not alone so do not be afraid to ask for assistance.