



Study Design and Analysis (BE-8069 / PH-8069)

Department of Environmental Health
University of Cincinnati College of Medicine

I. Course Information:

Title: Study Design and Analysis

Course #: BE-8069/ PH-8069

Credit Hours: 2

Term: Fall 2019 (19FS)

Class Location: Online

Class time: Online

Prerequisites: There is NO prerequisite for this class. However, students who take BE7022 / PH7010 Introduction to Biostatistics (available in summer and spring semesters) and BE7011 / PH 7011 Statistical Computation and Software (available in summer and fall semesters) may help better understand the contents of the class.

II. Instructor Information:

Name: Dr. Jun Ying

Title: Professor of Biostatistics

Office Information: Kettering Room 101

Office: (513)558-2767

Email: yingj@ucmail.uc.edu

Office Hours: By Appointment Only

Communication Policy: Students are encouraged to contact me anytime via email. A response will be given within 36-48 hours except on weekends. Office hours will be held by appointment only. The teaching assistant can be reached by email, and face-to-face meetings can be scheduled upon request.

III. Course Materials

Recommended but not required text books:

- Common Statistical Methods for Clinical Research with SAS® Examples, 3rd Edition by Glenn Walker and Jack Shostak.
- Epidemiology: 4th Edition by Leon Gordis.
- Fitting Poisson Regression Models Using the GENMOD Procedure: SAS® Course Notes by Mike Patetta.

Statistical Software: SAS Program will be used for statistical computation and analysis. Students can choose either one of the options to access to the software

- Purchasing a SAS license from UCit GetIT or UC book store (preferred).
<https://www.uc.edu/ucit/services/hardware-software/facstaff-software/sas.html>
- Using SAS from UC Virtual Lab (Free) <https://kb.uc.edu/KBArticles/UCVLabs-Windows.aspx>.

Notice

- The class has no obligation of support on software installation and online access. Students should contact UCIT or IT support of your department for information regarding SAS license and virtual lab.

- Even though this class offers codes for statistical computation using SAS Program, students can use any other software such as R or SPSS at their own choices to work on their homework assignments, final project, and in-class exercises.

IV. Course Description:

- **Course Description**

This course builds upon the epidemiologic concepts covered in the Introduction to Epidemiology course. Clinical epidemiologic study designs are examined in more detail and variants of the basic designs are introduced. Nested case-control designs, clinical trials, matching, and innovations such as case-cohort and counter-matched designs are examined in depth. Biostatistical methods appropriate for each type of study design are described and quantitative examples provided. Students are given the opportunity to use SAS Program to analyze clinical epidemiologic data. Data are given to students to permit them to practice methods and approaches they have learned in class. This is an applications course with minimal statistical theory.

V. Student Learning Outcomes:

Upon successful completion of this course, the learner will be able to:	How is this outcome assessed?
1. Learn various clinical epidemiologic study designs including randomized controlled trials, quasi-experimental studies, cohort and prospective studies, historical and retrospective studies, case-control, nested, unmatched and matched studies, cross-sectional, ecological, case series and case reports.	Exam1
2. Understand the importance of issues such as confounding, biasness, interaction, validity and reliability in various study designs	Exam1
3. Analyze data parametric and nonparametric statistical models	Exam2 and Exam3
4. Perform statistical computation using SAS Program	Exam2 and Exam3

VI. Instructional Methods:

Course Format: Online class with Learning Modules, Class Notes offered in the Blackboard.

Learning Modules: Learning Modules are posted on schedule. Please note students are required to complete reading the modules before the due dates to receive full points. Modules will be available throughout the semester after being posted but students can only receive partial or no points after the due dates.

VII. Course Communication:

University policy requires that the email set up in Blackboard is the primary means of communication. It is advisable that you use your UC email for this purpose and that you check it often. If you choose to change your email in Blackboard to a non-UC email it is your responsibility to ensure you check it frequently.

VIII. Course and Grading Policies:

- 1. Course Structure:** The course is designed as an in-person, residential class. Changes to the syllabus, due dates, course requirements or grading requirements will be made as far in advance as possible.
- 2. Academic Integrity:** All students shall comply with the Code of Student Conduct of the University of Cincinnati (UC) http://www.uc.edu/conduct/Academic_Integrity.html. Academic misconduct includes, but is not limited to: acts of cheating, plagiarism, falsification, and misappropriation of credit. The Student Code of Conduct defines behavior expected of all University of Cincinnati students. It is each student's responsibility to know and comply with the University's Student Code of Conduct. Academic misconduct will be zero tolerated in this course. Regardless of the type of assignment, students found responsible for violating the UC Academic Integrity Policy will receive an "F" for the course. All violations will be forwarded to the Office of University Judicial Affairs, Department of Student Life where a university disciplinary file will be created.
- 3. Disability:** Students with disabilities who need academic accommodations or other specialized services while attending the University of Cincinnati will receive reasonable accommodations to meet their individual needs as well as advocacy assistance on disability-related issues. Students requiring special accommodation must register with the Disability Services Office. [UC's Disability Services Office](#).
- 4. Counseling Services, Clifton Campus:** Students have access to counseling and mental health care through the University Health Services (UHS), which can provide both psychotherapy and psychiatric services. In addition, Counseling and Psychological Services (CAPS) can provide professional counseling upon request; students may receive five free counseling sessions through CAPS without insurance. Students are encouraged to seek assistance for anxiety, depression, trauma/assault, adjustment to college life, interpersonal/relational difficulty, sexuality, family conflict, grief and loss, disordered eating and body image, alcohol and substance abuse, anger management, identity development and issues related to diversity, concerns associated with sexual orientation and spirituality concerns, as well as any other issue of concerns. After hours, students may call UHS at 513-556-2564 or CAPS Cares at 513-556-0648. For urgent physician consultation after-hours students may call 513-584-7777.
- 5. Title IX:** Title IX is a federal civil rights law that prohibits discrimination on the basis of your actual or perceived sex, gender, gender identity, gender expression, or sexual orientation. Title IX also covers sexual violence, dating or domestic violence, and stalking. If you disclose a Title IX issue to me, I am required forward that information to the Title IX Office. They will follow up with you about how the University can take steps to address the impact on you and the community and make you aware of your rights and resources. Their priority is to make sure you are safe and successful here. You are not required to talk with the Title IX Office. If you would like to make a report of sex or gender-based discrimination, harassment or violence, or if you would like to know more about your rights and resources on campus, you can consult [UC's webpage for Title IX](#) or contact the office at 556-3349.
- 6. Class Attendance & Participation:** There is no specific requirement for class attendance. Participation is required through completion of scheduled modules and assignments. Details are provided in the next two policies.
- 7. Exams:** There are three exams in the semester. All exams are open book, open notes and open other resources. Each exam can be allowed to submit 2 times and only the last submission will be graded. The exams are posted

at 4am of day 1 and closed at 11:59pm of day 2. Notice once the Exam is open and started, it needs to be completed within 2 hours in each submission.

8. **Missed and/or late submission of exams:** Missed and/or late submission of an exam without a pre-approval from the instructor may result in a deduction of up to 25% of the score. **Missing 2 exams will automatically receive a final grade of "F" if without a valid excuse or an "I" (incomplete) with an excuse.** The instructor reserves the right to make decisions about extenuating circumstances on a case-by-case basis.
9. **Missed completion of scheduled modules:** Missed and/or late completion of watching an assigned module can be deducted up to 25% points without a pre-approval from the instructor. Failing to meet **3 module deadlines or will receive an "F" if without a valid excuse or an "I" (incomplete) with an excuse.** The instructor reserves the right to make decisions about extenuating circumstances on a case-by-case basis.
10. **Criteria for letter grades:** Students receive a raw score from each module and homework assignment. The raw scores are converted into standard scores 0-100 and aggregated into a total score using the following allocation formula. The letter grade from the course will be based upon the standard score using cuts determined from the overall distribution of the standard score in the class as well as history data from previous classes.

Standard Score Allocation:

Components	<i>Distribution of grades</i>
Learning modules	25%
Exams	75%
Total	100%

IX. Course Schedule:

The following Table lists dates of course materials including notes and modules and exams. The due time is 11:59pm of the listed due dates.

Table

Contents	Posted Date of Module, Course Material, and Exam	Module / Exam Due Date
Lecture 1 - Study Design Overview; Surveillance Systems; Data Collection; Setting up an Epidemiologic Study	8/26/2019	9/5/2019
Lecture 2 - Study Design	9/6/2019	9/15/2019
Lecture 3 - Measurements	9/16/2019	9/25/2019
Lecture 4 - Error/Bias; Validity/Reliability; Confounding/Interaction	9/26/2019	10/5/2019
EXAM1 – Lectures 1-4	10/6/2019	10/7/2019
Lecture 5 - Overview of Statistical Analyses; Analysis of Continuous Data (1)	10/8/2019	10/17/2019
Lecture 6 - Analysis of Continuous Data (2)	10/18/2019	10/27/2019
Lecture 7 - Analysis of Non-Parametric Data	10/28/2019	11/7/2019
EXAM2 – Lectures 5-7	11/8/2019	11/9/2019
Lecture 8 - Analysis of Discrete Data (1)	11/10/2019	11/19/2019
Lecture 9 - Analysis of Discrete Data (2)	11/20/2019	11/29/2019
Lecture 10 - Repeated Measures Analysis; Survival Analysis	11/30/2019	12/9/2019
EXAM3 Lectures 8-10	12/10/2019	12/11/2019