Introduction to Biostatistics (PH-7010 / BE-7022)

Department of Environmental Health
University of Cincinnati College of Medicine

I. Course Information:

Title: Introduction to Biostatistics
Course #: PH-7010/ BE-7022
Credit Hours: 3
Term: Summer 2019 (19US)
Class Location: Online
Class time: Online
Prerequisites: No course prerequisites.

II. Instructor Information:

Name: Dr. Jun Ying
Title: Professor of Biostatistics
Office Information: Kettering G06
Office: (513)558-2767
Email: yingj@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
Any book entitled "Introduction to Biostatistics" or "Introduction to Statistics" or "Basic Biostatistics" or "Basic Statistics" can be used as your own reference.

Statistical Software
The class will teach SAS Enterprise 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 lab instruction on statistical computation using SAS enterprise, 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.

UNIVERSITY OF Cincinnati
College of Medicine

IV. Course Description:

This course will provide an introduction of basic concepts of statistics, methods of statistical analysis, and tools of statistical computation. The goal is to help students understand the language of statistics and the art of statistical investigation; perform basic statistical analysis of their own research; and read and evaluate analytical results in health and research articles

V. Student Learning Outcomes:

Upon successful completion of this course, the learner will be able to:	How is this outcome assessed?	MPH Competency (Ref for MPH students only)
1. Collect data using appropriate datasets, variables, observations and values.	HWK1	CEPH 2
2. Use descriptive statistics and graphical methods to describe sample data.	HWK2	
3. Understand the reasoning by which findings from sample data can be extended to larger, more general populations.	HWK3	
4. Estimate population parameters using point and interval estimation.	HWK4	CEPH 3
5. Perform hypothesis tests about one, two, or more than two population means or proportions.	HWK4, HWK5, HWK6	CEPH 3
6. Use regression and correlation techniques to examine linear relationships in data.	HWK7	CEPH 3
7. Perform statistical computations and read statistical summaries using software packages SAS Enterprise and Excel.	HWK2-7 + Final Project	CEPH 3
8. Interpret results and findings from statistical analysis on a real world dataset.	Final Project	CEPH 4

VI. Instructional Methods:

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

Leaning Modules:

Learning Modules are posted on each Friday morning. Please note students are required to complete reading before Thursday mid night of the next week. Modules will still be available after due dates but no credits will be provided after due dates/time.

WebEX Sessions:
Recorded WebEX will be posted online.

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. **Missed and/or late submission of final project, homework assignments, and missed completion of scheduled modules:** Missed and/or late submission of the final project can result in up to a 25% deduction of the score from the final project. Missed and/or late submission of each homework assignment can result in up to a 25% reduction of the score on the corresponded homework. Missed and/or late completion of watching an assigned module can result in up to a 25% deduction of the corresponded points from this module. Missed in-class assignments can result in up to a 25% deduction of the corresponded points.

7. **Class Attendance & Participation:** Participation are important for successful completion of the course. Failing to meet ***3 module deadlines or missing 2 assignments or missing the final project 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.

8. **Criteria for letter grades**: Students receive a raw score from each module, homework assignment, and the final project. 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 a letter grade scale in the next table (the percentage cut may vary by semester based upon the overall distribution of the total score in the class).

Standard Score Allocation:

Components	***Distribution of grades***
Learning modules each week and in class exercises	*40%*
Homework and In class exercise	*40%*
Final (Take Home) Project	*20%*
Total	***100%***

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College of Medicine

IX. Course Schedule:

Table1 Contents and modules

Week	Dates	Contents	Module	SAS Module	In Class Practice
1	6/3-6/11	Introduction; Measures; Graphic	1.1, 1.2, 2.1, 2.2	1	
2	6/12-6/18	Summary Statistics; Probability and Distributions	3.1, 3.2, 4.1, 4.2	2, 3, 4, 5	Modeule4 In Class 2A, 2B
3	6/19-6/25	Probability and Distributions; Inference, CI and HT	4.2, 5.1, 5.2	5, 6, 7	
4	6/26-7/2	Inference, CI and HT	5.1, 5.2, 5.3	6, 7, 8	
5	7/3-7/9	Comparing Means	6.1, 6.2	9,10,11	
6	7/10-7/16	Comparing Means	6.1, 6.2	9,10,11	
7	7/17-7/23	ANOVA	7	12	
8	7/22-7/31	Comparing Proportions; Regression	8.1, 8.2, 9.1, 9.2	13, 14	
8	7/30 **(No Grade)**	Summary	Pre-recorded WebEX	na	

Table2 Schedule for homework (HWK) and final project

HWK	Posted Date	Due Date
HWK1 (Data, Variable, Observation and Value)	6/3	6/12
HWK2 (Graph and Summary Statistics)	6/12	6/21
HWK3 (Probability and Distribution)	6/19	6/28
HWK4 (CI and HT)	6/26	7/5
HWK5 (Compare Means)	7/3	7/22
HWK6 (ANOVA)	7/17	7/26
HWK7 (Proportion and Regression)	7/22	7/31
Final Project	7/1	7/31