

Argosy University

COURSE SYLLABUS

PH6014

Biostatistics: Analysis and Application

Faculty Information

Faculty Name:

Campus:

Contact Information:

Office Hours:

Short Faculty Bio:

Course description: In this introductory course, students develop and apply statistical and ethnographic reasoning and methods in addressing, analyzing and solving problems in public health, healthcare, biomedical, clinical and population based research. They use data and information in analyzing the impact of changes and trends across health systems, and address implications of these factors on individual, family and community health.

Course Pre-requisites:

Required Textbook/Readings:

IMPORTANT: Effective Summer II (July 1, 2010): You are not required to purchase the textbook for this course. Your textbook will be available to you as an electronic book with your fully online or blended course on the eCollege platform.

Sullivan, L.M. (2008). *Essentials of biostatistics in public health*. Jones & Bartlett Publishers. ISBN-13: 9780763756208 (with workbook)

Lirn.net:

Trepka, M.J. (2005). Using surveillance data to develop and disseminate local childhood lead poisoning screening recommendations: Miami-Dade County's experience, *American Journal of Public Health*, 95(4): 556-558. (Week 6)

Enander, R.T., et. al. (2007). Environmental health practice: statistically based performance management, *American Journal of Public Health*, 97(5): 819-824. (Week 7)

PubMed Central:

Elder, K., et. al. (2007). African American's decision not to evacuate New Orleans before Hurricane Katrina: a qualitative study, *American Journal of Public Health*, S124-S129. (Week 2)

Hser, Y. & Evans, E. (2008). Cross-system data linkage for treatment outcome

evaluation: lessons learned from the California Treatment Outcome Project, *Eval Program Plann*, 31(2): 125-135 (Week 5)

Recommended Websites:

www.cdc.gov/mmwr

www.cdc.gov/healthyyouth/evaluation/pdf/brief19.pdf

Course length: 7.5 Weeks

Contact Hours: 45 Hours

Credit Value: 3.0

Program Outcomes:

1. Health Policy Management

- a. Examine public health problems and develop proposed policies that illustrate pertinent legislative issues, advocacy opportunities, communication, media management and system issues to successfully pass, communicate, and implement the policy.
- b. Align policies that contribute and promote health and well being with local cultures and realities to guide effective practices that improve health status.

2. Healthcare and Organizational Management

- a. Assess organizational norms and values, and build coalitions and consensus around organizational vision, priorities, state and national health and wellness agendas with clear performance impacts.
- b. Manage and determine costs and implications for public health programs with un-met needs, and develop plans to meet customer needs and improve health outcomes.

3. Communication and Informatics

- a. Develop proposals for public health organizations to invest in and implement integrated information systems that collect, track, and share information across critical networks of providers and IT systems, to improve processes, quality of care, and service outcomes.
- b. Examine customer/community needs and apply a 'systems approach' in successfully addressing those needs by aligning the organization and customer needs with leading information technology and communicating the improvements to key stakeholders.

4. Systems Thinking

- a. Analyze the make-up of organizational systems and its characteristics, evaluating the impact of changes in the input, processes, and output on the health outcomes.
- b. Analyze the interrelations among public health systems and key stakeholders to influence the political, social, economic, and educational factors that impact public health systems.

5. Performance Improvement

- a. Propose a performance improvement system that includes assessment of the organizational capacity, culture, readiness, and planning to establish performance baseline, goals and performance management process for monitoring progress and continuous improvements.
- b. Integrate public health informatics, information systems and technology, and communication strategies in the design, implementation, evaluation, and replication of best practices for monitoring and improving overall practice, performance, and outcomes of the program/organization.

6. Interpersonal Effectiveness

- a. Examine the importance of interpersonal relationships with key stakeholders to establish, build, and sustain effective alliances to successfully address priority health problems in the community.

Course Objectives:

- Articulate the fundamental concepts and terminology of biostatistics. ST1
- Differentiate between qualitative and quantitative data collection methods including their strengths, limitations, and appropriate uses for research. PI2; ST1
- Analyze determinants of health and disease using an ecological framework. HOM 2
- Apply the appropriate biostatistical methods for describing and evaluating public health data. C&I 1
- Identify and collaborate with critical stakeholders in the planning, implementation and evaluation of public health programs, policies and interventions. HP 2

Activities/Assignments/Assessments Table

	Topics	Resources
1	Overview of	Reading Resources/Digital Assets

	<p>Biostatistics</p> <ul style="list-style-type: none"> • Definition • Issues involved in designing a statistical study 	<ul style="list-style-type: none"> • Chapter 1 • Chapter 1 Essentials of Biostatistics Workbook
2	<ul style="list-style-type: none"> • Qualitative Data • Quantitative Data • Study Design 	<p>Reading Resources/Digital Assets</p> <ul style="list-style-type: none"> • Chapter 2 • Chapter 2 Essentials of Biostatistics Workbook • http://www.cdc.gov <ul style="list-style-type: none"> ◦ Nutrition, Physical Activity and Obesity Inventory of Qualitative Research • http://www.cdc.gov/healthyyouth/evaluation/pdf/brief19.pdf • Elder, K., et. al. (2007). African American’s decision not to evacuate New Orleans before Hurricane Katrina: a qualitative study, <i>American Journal of Public Health</i>, S124-S129. <p>LAS Assessment 1: (COs 1, 2, 4); 10%</p> <p>An investigator wants to assess whether smoking is a risk factor for pancreatic cancer. Electronic medical records at a local hospital will be used to identify 50 patients with pancreatic cancer. One hundred patients who are similar but free of pancreatic cancer will also be selected. Each participant’s medical record will be analyzed for smoking history.</p> <p>Identify the type of study proposed and indicate the specific strengths and weaknesses of the study. What is the most likely source of bias in the study?</p>
3	<p>Quantifying Data</p> <ul style="list-style-type: none"> • Techniques to quantify disease • Prevalence and incidence measures 	<p>Reading Resources/Digital Assets</p> <ul style="list-style-type: none"> • Chapter 3 • Chapter 3 Essentials of Biostatistics Workbook
4	<p>Methods for Describing Public Health Data</p> <ul style="list-style-type: none"> • Dichotomous, ordinal, categorical and continuous 	<p>Reading Resources/Digital Assets</p> <ul style="list-style-type: none"> • Chapter 4 • Chapter 4 Essentials of Biostatistics Workbook

	<p>outcome variables</p> <ul style="list-style-type: none"> • Relative frequencies, means, medians, standard deviations, quartiles and ranges 	
5	<p>Methods for Evaluating Public Health Data</p> <ul style="list-style-type: none"> • Conditional probabilities • Application of basic principles of probability to public health 	<p>Reading Resources/Digital Assets</p> <ul style="list-style-type: none"> • Chapter 5 • Chapter 5 Essentials of Biostatistics Workbook • Hser, Y. & Evans, E. (2008). Cross-system data linkage for treatment outcome evaluation: lessons learned from the California Treatment Outcome Project, <i>Eval Program Plann</i>, 31(2): 125-135
6	<p>Biostatistics Application in Planning Programs, Policies, and Interventions</p>	<p>Reading Resources/Digital Assets</p> <ul style="list-style-type: none"> • Chapter 6 • Chapter 6 Essentials of Biostatistics Workbook • Trepka, M.J. (2005). Using surveillance data to develop and disseminate local childhood lead poisoning screening recommendations: Miami-Dade County's experience, <i>American Journal of Public Health</i>, 95(4): 556-558.
7	<p>Biostatistics Application in Planning Programs, Policies, and Interventions</p> <ul style="list-style-type: none"> • Assumptions and appropriate interpretation of tests of hypothesis • Biostatistics are used to evaluate programs in published studies 	<p>Reading Resources/Digital Assets</p> <ul style="list-style-type: none"> • Chapter 7 • Chapter 7 Essentials of Biostatistics Workbook • Enander, R.T., et. al. (2007). Environmental health practice: statistically based performance management, <i>American Journal of Public Health</i>, 97(5): 819-824.
8	<p>Biostatistics Application in Planning</p>	<p>Reading Resources/Digital Assets</p> <ul style="list-style-type: none"> • Chapters 8 & 9 • Chapter 8 & 9 Essentials of Biostatistics Workbook

<p>Programs, Policies, and Interventions</p> <ul style="list-style-type: none"> • Confounding and effect modification • assumptions and logic of analysis of relationships among variables 	<p>LAS Assessment 2: 30%</p> <p>Go to www.cdc.gov; Click on Data & Statistics- More Data & Statistics; Scroll own to Data Access Tools; Click on BRFSS interactive data base; Click on SMART: City and County Data; Click on Access Local Area Health risk data</p> <p>The Behavioral Risk Factor Surveillance System (BRFSS) is the world’s largest, on-going telephone health survey system, tracking health conditions and risk behaviors in the United States yearly since 1984. Currently, data are collected monthly in all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam.</p> <p>Choose any state and local area to study.</p> <ol style="list-style-type: none"> 1. Select your criteria for MMSA and for Category and view the data. 2. Write a detailed report that describes the data. Discuss the data validity, quality and reliability. Include any strengths or weaknesses that may exist with the data. Make recommendations on what other data should be collected? What type of study design would you recommend? Who should you work with to collect the data? How should the findings be displayed? 3. Based on the data, what public health intervention might you recommend for the chosen population? Who would you give your recommendation to?
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Grading Criteria

Grading Scale

Grading requirements

A	100 – 93 %
A-	92 – 90 %
B+	89 – 88 %
B	87 – 83 %
B-	82 – 80 %
C+	79 – 78 %
C	77 – 73 %
C-	72 – 70 %

F	69 and below
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<i>Attendance/participation</i>	<i>10%</i>
<i>Weekly Assignments</i>	<i>60%</i>
<i>LAS Assessment(s)</i>	<i>40%</i>
	<i>100%</i>

Library

All resources in Argosy University's online collection are available through the Internet. The campus librarian will provide students with links, user IDs, and passwords.

Library Resources: Argosy University's core online collection features nearly 21,000 full-text journals and 23,000 electronic books and other content covering all academic subject areas including Business & Economics, Career & General Education, Computers, Engineering & Applied Science, Humanities, Science, Medicine & Allied Health, and Social & Behavior Sciences. Many titles are directly accessible through the Online Public Access Catalog at <http://library.argosy.edu>. Detailed descriptions of online resources are located at <http://library.argosy.edu/libweb/resources/>

In addition to online resources, Argosy University's onsite collections contain a wealth of subject-specific research materials searchable in the Online Public Access Catalog. Catalog searching is easily limited to individual campus collections. Alternatively, students can search combined collections of all Argosy University Libraries. Students are encouraged to seek research and reference assistance from campus librarians.

Information Literacy: Argosy University's Information Literacy Tutorial was developed to teach students fundamental and transferable research skills. The tutorial consists of five modules where students learn to select sources appropriate for academic-level research, search periodical indexes and search engines, and evaluate and cite information. In the tutorial, students study concepts and practice them through interactions. At the conclusion of each module, they can test their comprehension and receive immediate feedback. Each module takes less than 20 minutes to complete. Please view the tutorial at <http://library.argosy.edu/infolit/>

Academic Policies

Academic Dishonesty/Plagiarism: In an effort to foster a spirit of honesty and integrity during the learning process, Argosy University requires that the submission of all course assignments represent the original work produced by that student. All sources must be

documented through normal scholarly references/citations and all work must be submitted using the current edition of the *Publication Manual of the American Psychological Association*. Students are encouraged to purchase this manual and become familiar with its content as well as consult the Argosy University catalog for further information regarding academic dishonesty and plagiarism.

Scholarly writing: The faculty at Argosy University is dedicated to providing a learning environment that supports scholarly and ethical writing, free from academic dishonesty and plagiarism. This includes the proper and appropriate referencing of all sources. You may be asked to submit your course assignments through “Turnitin,” (www.turnitin.com), an online resource established to help educators develop writing/research skills and detect potential cases of academic dishonesty. Turnitin compares submitted papers to billions of pages of content and provides a comparison report to your instructor. This comparison detects papers that share common information and duplicative language.

Americans with Disabilities Act Policy

It is the policy of Argosy University to make reasonable accommodations for qualified students with disabilities, in accordance with the Americans with Disabilities Act (ADA). If a student with disabilities needs accommodations, the student must notify the Director of Student Services. Procedures for documenting student disability and the development of reasonable accommodations will be provided to the student upon request.

Students will be notified by the Director of Student Services when each request for accommodation is approved or denied in writing via a designated form. To receive accommodation in class, it is the student’s responsibility to present the form (at his or her discretion) to the instructor. In an effort to protect student privacy, the Department of Student Services will not discuss the accommodation needs of any student with instructors. Faculty may not make accommodations for individuals who have not been approved in this manner.

The Argosy University Statement Regarding Diversity

Argosy University prepares students to serve populations with diverse social, ethnic, economic, and educational experiences. Both the academic and training curricula are designed to provide an environment in which students can develop the skills and attitudes essential to working with people from a wide range of backgrounds.