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Jiann-Ping Hsu College of Public Health Syllabi

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Fall 2019

### BIOS 9130—Research Seminar in Biostatistics

Robert Vogel

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# GEORGIA SOUTHERN UNIVERSITY

## *Jiann-Ping Hsu College of Public Health*

BIOS 9130—Research Seminar in Biostatistics

Fall 2019

**Instructor:** Robert Vogel  
**Office:** 1013 Hendricks Hall  
**Phone:** 478-7423  
**E-Mail Address:** [rvogel@georgiasouthern.edu](mailto:rvogel@georgiasouthern.edu)  
**Office Hours:** by appointment

**Web Page:** Yes  
**Class Meets:** TR – 2:00 PM-to-3:15 PM, Hendricks Hall 2020

Course Catalog available at:  
<http://em.georgiasouthern.edu/registrar/resources/catalogs/>  
under Jiann-Ping Hsu College of Public Health Programs

**Prerequisites:** NA [http://www.ats.ucla.edu/stat/sas/notes\\_old/movies/IntroSAS1.html](http://www.ats.ucla.edu/stat/sas/notes_old/movies/IntroSAS1.html)  
<http://www.scs.unr.edu/~richmon4/richmondstats.htm>

**Course Credit:** This is a three-credit hour course designed for the DrPH core curriculum.

**Course Structure:** This course is an in-person meeting class.

**Catalog Description:** This course is designed to provide the student with the current best practices in biostatistical consulting. Topics include: Identifying and constructing appropriate questions to ask clients regarding their consultation request, an overview of appropriate statistical methods and SAS software procedures to use for specific study designs and statistical analysis of collected data, directing a consultation appointment without faculty lead, conducting exploratory data analyses, conducting effective analyses based on appropriate statistical methods, conducting needed simulation (including Monte Carlo methods and Bootstrap methods) and providing oral and written communication of statistical findings. 3 credit houses

**Required Textbook:** Javier Cabrera Andrew McDougall A. McDougall (2002).  
Statistical Consulting. Springer

- Required Resources:**
- 1- Janice Derr (2000). Statistical Consulting A Guide to Effective Communication, 1<sup>st</sup> Edition. Duxbury Press.
  - 2- Byron J. T. Morgan (1984) Elements of Simulation. Chapman and Hall, New York.
  - 3- Efron, Bradely (1982). The Jackknife, the Bootstrap and other Resampling Plans.

**DrPH Core Student Learning Outcomes**

1. Apply evidence-based practice and research methods to advance the field of public health.
2. Develop culturally-sensitive public health policies or programs using interdisciplinary approaches grounded in legal and ethical principles.
3. Integrate knowledge, legal and regulatory approaches, ethical frameworks and varied stakeholder interests in addressing public health problems.
4. Communicate public health information to diverse stakeholders, including individuals at all levels of health literacy, for purposes of influencing behavior and policies.
5. Propose strategies for health improvement and elimination of health inequities including stakeholders, researchers, practitioners, community leaders and other partners.

**CEPH Concentration Competencies**

1. Interpret analytic methods used in the public health and biomedical journals, as well as critique published reports of public health and biomedical experiments as to the validity of the inferential conclusions.
2. Analyze public health and biomedical data using appropriate statistical methods and demonstrate the proficiency in statistical software such as SAS and R.
3. Develop new biostatistical methods and new ideas for applying existing biostatistical methods to applications in public health and the biomedical sciences.
4. Demonstrate the ability to incorporate prior knowledge to solve biomedical problems via Bayesian analysis.
5. Demonstrate the cognition of the underlying statistical theory that supports the biostatistical methodology.

## **CEPH DrPH Competencies**

### **Data & Analysis**

1. Explain qualitative, quantitative, mixed methods and policy analysis research and evaluation methods to address health issues at multiple (individual, group, organization, community and population) levels
2. Design a qualitative, quantitative, mixed methods, policy analysis or evaluation project to address a public health issue
3. Explain the use and limitations of surveillance systems and national surveys in assessing, monitoring and evaluating policies and programs and to address a population's health

### **Leadership, Management & Governance**

4. Propose strategies for health improvement and elimination of health inequities by organizing stakeholders, including researchers, practitioners, community leaders and other partners
5. Communicate public health science to diverse stakeholders, including individuals at all levels of health literacy, for purposes of influencing behavior and policies
6. Integrate knowledge, approaches, methods, values and potential contributions from multiple professions and systems in addressing public health problems
7. Create a strategic plan
8. Facilitate shared decision making through negotiation and consensus-building methods
9. Create organizational change strategies
10. Propose strategies to promote inclusion and equity within public health programs, policies and systems
11. Assess one's own strengths and weaknesses in leadership capacities including cultural proficiency
12. Propose human, fiscal and other resources to achieve a strategic goal
13. Cultivate new resources and revenue streams to achieve a strategic goal

### **Policy & Programs**

14. Design a system-level intervention to address a public health issue
15. Integrate knowledge of cultural values and practices in the design of public health policies and programs
16. Integrate scientific information, legal and regulatory approaches, ethical frameworks and varied stakeholder interests in policy development and analysis
17. Propose interprofessional team approaches to improving public health

### **Education & Workforce Development**

18. Assess an audience's knowledge and learning needs
19. Deliver training or educational experiences that promote learning in academic, organizational or community settings
20. Use best practice modalities in pedagogical practices

**Course Performance Based Objectives:** At the completion of this course the student will be able to:

1. Identify the history of science and the role of statistics, the scientific method, statistical consulting environments and the role of the statistician within a scientific environment.
2. Understand how to communicating with researchers from other areas, do report writing.
3. Distinguish between the statistical methods that will be used in the statistical consultation and of the computational tools and statistical software such as SAS and S-PLUS that are available.
4. Identify the need of the prior information and the financial issues and the concept of the first meeting. Manage the necessary documentation. Project analysis. Presenting the results. Writing the final report.
5. List the details of case studies and illustrate the presentation format of case studies.
6. Design and conduct simulation study including, how to generate random numbers from different distribution, Monte Carlo methods of approximation and Bootstrap methods of estimations.

### **Assessment of Student Learning**

Detailed descriptions of assessments that are linked to student learning outcomes and or competencies.

Students may vary in their ability to achieve levels of competence in this course. Students can expect to achieve course competence only if they honor all course policies, attend classes regularly, complete all assigned work in good faith and on time, and meet all other course expectations of them as students.

**Overview of the Content to be Covered During the Semester:**

| Week  | Topic  | Readings                     | Assessments                 |
|-------|--|------------------------------|-----------------------------|
| 1     | Introduction and organization of the course.<br>(Learning Objectives: 1)                     | Text , Chapter 1             | To be announce in the class |
| 2     | Communicating with researchers from other areas.<br>Report writing. (Learning Objectives: 2) | Text , Chapter 2             | To be announce in the class |
| 3-4   | Methodological aspects<br>(Learning Objectives: 3)   | Text , Chapter 3, Appendix B | To be announce in the class |
| 5-6   | A consulting Project from A-Z<br>(Learning Objectives: 4)                                    | Text , Chapter 4             | To be announce in the class |
| 7     | Introduction to Case Studies<br>(Learning Objectives: 5)                                     | Text , Chapter 5             | To be announce in the class |
| 9-10  | Case Studies (Group I) (<br>Learning Objectives: 6)  | Text , Chapter 6             | To be announce in the class |
| 11-12 | Case Studies (Group II) (<br>Learning Objectives: 7)   | Text , Chapter 7             | To be announce in the class |
| 13-14 | Case Studies (Group III) (<br>Learning Objectives: 8)  | Text , Chapter 8             | To be announce in the class |
| 14    | Random Number generating (<br>Learning Objectives: 9)  | Morgan, Chapters 1, 2, 3, 4  | To be announce in the class |
| 15    | Monte Carlo method of approximation (<br>Learning Objectives: 10)                            | Morgan, Chapters 5, 6        | To be announce in the class |
| 16    | Bootstrap methods (<br>Learning Objectives: 11)  | Class notes                  | To be announce in the class |

**Portfolio Inclusion**

Samples of your work may be reproduced for search purposes and/or inclusion in the professor's teaching portfolio. You have the right to review anything selected for use, and subsequently ask for its removal.

**Instructional Methods:** Class meetings will be a combination of lecture, class discussion, and active participation. Computer-generated presentations will be used in the

lecture portion of this course. Prior to each lecture, the student is encouraged to complete the recommended readings and actively participate in class discussions. In this way, it is hoped that the learner will be better prepared to successfully accomplish the learning objective of each lecture experience.

**Exam Schedule and Final Examination:**

Midterm Examination: Case Study presentation October 17 2019  
Final Examination: December 10, 2019 Final Project Presentation. 3:00-5:00pm

**Grading:**

Weighting of assignments for purposes of grading will be as follows:

|                    |                             |            |
|--------------------|-----------------------------|------------|
| Midterm Exam (30%) | (Learning Objectives: 1-6)  | 100 points |
| Final Exam (40%)   | (Learning Objectives: 1-14) | 100 points |
| Assignments (30%)  | (Learning Objectives: 1-11) | 300 points |

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Total Possible Points  
500 points (100%)

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The following point scale will be utilized in grading:

450-to-500 points (90%) A  
400-to-449 points (80%) B  
350-to-399 points (70%) C  
300-to-349 points (60%) D

A cumulative total of 299 points or less will be considered as failing.

For calculation of your final grade, all grades above will be included.

Your grades ***will not*** be posted. All exams and assignments will be graded and returned promptly so that students may accurately calculate their grades at any point in time during the semester.

There are times when extraordinary circumstances occur (e.g., serious illness, death in the family, etc.). In such circumstances, and/or if you need additional time to satisfactorily complete any course requirement, please consult with the instructor within a reasonable amount of time. *Nota Bene:* Extensions are not guaranteed and will be granted solely at the discretion of the instructor.  
NO EXTRA CREDIT PROJECTS WILL BE ASSIGNED!

### **General Expectations**

1. For every one-credit hour, you should expect to work roughly two hours outside the classroom each week. For example, for a three credit hour course, during a regular fifteen week semester, you should expect approximately ninety hours of work outside of class.
2. Students are expected to keep up with the class, to read the required material, and to submit assignments and activities by due dates and times.
3. Students are expected to independently complete all activities, exercises, assignments, and assessments including exams.
4. Students are expected to produce quality work. Typos and grammar errors should be kept to a minimum. The format and readability of submissions will be taken into consideration when assigning a grade.
5. Remember to check when assignments are due. It is recommended that you stay ahead of schedule on the assignments, so if an emergency happens, your assignment will be completed and ready to submit within the designated time frame. It is your responsibility to keep track of the due dates for each assignment.

### **Response Times**

During a normal work week (i.e., Monday 9:00 AM through Friday 5:00 PM) students can expect responses as follows:

- Email: within 48 hours
- Discussion posts: within 72 hours
- Assignment grades: within 72 hours of submission date.

Exceptions: I may not check FOLIO or GSU email over the weekends. If you send me an email after 5:00 PM on Friday, please do not expect a response until the following Monday.

All assignments will be graded promptly so that students may accurately calculate their grades at any point in time during the semester. There are times when extraordinary circumstances occur (e.g., serious illness, death in the family, etc.). In such



circumstances, and/or if you need additional time to satisfactorily complete any course requirement, please consult with the instructor within a reasonable amount of time. Extensions are not guaranteed and will be granted solely at the discretion of the instructor.

### **Course Expectations**

#### **Texting and Use of Cell Phones (and Other Technologies)**

Please do not text in class or use your cell phone during class! Texting during class (or in a meeting) is disruptive and rude...at least to me. My preference is that you put cell phones away during class meetings so they are not a source of temptation. Offenders will be asked to leave.

#### **Class Attendance and Participation Policy**

Federal regulations require attendance be verified prior to distribution of financial aid allotments. Regular attendance is expected. Your attendance will be verified at the first regular class session.

It is the policy of the University to permit students, faculty, and staff to observe those holidays set aside by their chosen religious faith. The faculty should be sensitive to the observance of these holidays so that students who choose to observe these holidays are not seriously disadvantaged. It is the responsibility of those who wish to be absent to make arrangements in advance with their instructors.

Students participating in authorized activities as an official representative of the University (i.e., athletic events, delegate to regional or national meetings or conferences, participation in university-sponsored performances, and **JPHCOPH funded**) will not receive academic penalties and, in consultation with the instructor of record, will be given reasonable opportunities to complete assignments and exams or given compensatory assignment(s) if needed. The student must provide written confirmation from a faculty or staff advisor to the course instructor(s) at least 10 days prior to the date for which the student will be absent from the class. The student is responsible for all material presented in class and for all announcements and assignments. When possible, students are expected to complete these assignments before their absences. In the event of a disagreement regarding this policy, an appeal may be made by either the student or the instructor of record to the corresponding college dean. (*University Graduate Catalog*)

#### **Academic Misconduct**

As a student registered at this University, it is expected that you will adhere to only the strictest standards of conduct. It is recommended that you review the latest edition of the *Student Conduct Code* book, as well as the latest *Undergraduate & Graduate Catalog* to familiarize yourself with the University's policies in this regard. Your continued

enrollment in this course is an implied contract between you and the instructor on this issue; from this point forward, it is assumed that you will conduct yourself appropriately.

### **Plagiarism:**

According to the Academic Dishonesty Policy of Georgia Southern University, Plagiarism includes (but is not limited to):

- A. Directly quoting the words of others without using quotation marks or indented format to identify them.
- B. Using published or unpublished sources of information without identifying them.
- C. Paraphrasing material or ideas without identifying the source.
- D. Unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic material.

If you are accused of plagiarism by a JPHCOPH, the following policy, as per the Judicial Affairs website: (<http://students.georgiasouthern.edu/judicial/faculty.htm>) will be enforced:

#### PROCEDURES FOR ADJUDICATING ACADEMIC DISHONESTY CASES

##### **First Offense - In Violation Plea**

1. If the professor and the Dean of Students agree that the evidence is sufficient to warrant a charge of academic dishonesty, the professor should contact the Office of Judicial Affairs to determine if this is a first violation of academic dishonesty. The incident will be reported via the following website:

<http://students.georgiasouthern.edu/judicial/faculty.htm>

2. If it is a first violation, the professor should talk with the student about the violation. **If the student accepts responsibility in writing and the professor decides to adjudicate the case, the following procedures will be followed:**

- a. The student will be placed on disciplinary probation for a minimum of one semester by the Office of Judicial Affairs.
- b. The student will be subject to any academic sanctions imposed by the professor (from receiving a 0 on the assignment to receiving a failing grade in the class).
- c. A copy of all the material involved in the case (Academic Dishonesty Report Form and the Request for Instructor to Adjudicate Form) and a brief statement from the professor concerning the facts of the case and the course syllabus should be mailed to the Office of Judicial Affairs for inclusion in the student's discipline record.

##### **First Offense - Not in Violation Plea (student does not admit the violation)**

If the professor and the Dean of Students agree that the evidence is sufficient to warrant a charge of academic dishonesty, the professor should contact the Office of Judicial Affairs to determine if this is the first or second violation of academic dishonesty. The student will be charged with academic dishonesty and the University Judicial Board or a University Hearing Officer would hear the case. If the student is found responsible, the following penalty will normally be imposed:

- a. The student will be placed on Disciplinary Probation for a minimum of one semester by the Office of Judicial Affairs.
- b. The student will be subject to any academic sanctions imposed by the professor.

### **Second Violation of Academic Dishonesty**

If the professor and the Dean of Students agree that the evidence is sufficient to warrant a charge of academic dishonesty, and if it is determined this is the second violation, the student will be charged with academic dishonesty and the University Judicial Board or a University Hearing Officer would hear the case.

#### **If the student is found responsible, the following penalty will normally be imposed:**

- a. Suspension for a minimum of one semester or expulsion.
- b. The student will be subject to any academic sanctions imposed by the professor.

### NOT RESPONSIBLE FINDING

When a student is found not responsible of academic dishonesty, the work in question (assignment, paper, test, etc.) would be forwarded to the Department Chair. It is the responsibility of the Chair to ensure that the work is evaluated by a faculty member other than the individual who brought the charge and, if necessary, submit a final grade to the Registrar. For the protection of the faculty member and the student, the work in question should not be referred back to the faculty member who charged the student with academic dishonesty.

In the case of a Department Chair bringing charges against a student, an administrator at the Dean's level will ensure that the student's work is evaluated in an appropriate manner.

### CONFIDENTIALITY

In accordance with provisions of the Family Educational Rights and Privacy Act of 1974 and the Georgia Open Records Act, any information related to a violation of academic dishonesty or the outcome of a judicial hearing regarding academic dishonesty, is prohibited and must be treated as confidential by members of the faculty."

### Disability-related Accommodations

Georgia Southern University is committed to providing reasonable accommodations to students with documented disabilities as required under federal law. Disabilities may include ADD or AD/HD, autism spectrum disorder, brain injury, chronic medical conditions, communication disorders, hearing loss, learning disabilities, mobility impairment, psychological disorders, visual impairment or temporary injuries. The purpose of disability accommodation is to provide equal access to the academic material and equal access to demonstrate mastery of the material. If you have a disability and need accommodations, please contact the Student Accessibility Resource Center (SARC). You will need to meet with a SARC staff member who can help you gather documentation of your disability or refer you to an appropriate resource for assessment. Once documentation of the disability is approved, SARC staff will provide you with an accommodation letter detailing the approved accommodations which you should present

to me so we can discuss and implement your accommodations. Disability accommodations work best starting at the beginning of the semester, but can be approved and started at any point in the semester. Accommodations start at the time the accommodation letter is presented to faculty within reasonable timelines; accommodations are not given retroactively. SARC on the Statesboro campus is located on the second floor of Cone Hall and the phone number is (912) 478-1566. SARC for Savannah and Liberty campuses is located on the second floor of Memorial College Center and the phone number is (912) 344-2572.

### **University Calendar for the Semester**

The University Calendar is located with the semester schedule, and can be found at: <http://em.georgiasouthern.edu/registrar/resources/calendars/>

### **One Final Note**

The contents of this syllabus are as complete and accurate as possible. The instructor reserves the right to make any changes necessary to the syllabus and course material to ensure better student learning. The instructor will announce any such changes in class. It is the responsibility of the student to know what changes have been made in order to successfully complete the requirements of the course.

This syllabus, my lecture notes, and all materials distributed and presented during this course are protected by copyright law. You are authorized to take notes in this class but that authorization extends to only making one set of notes for your personal use and no other use. You are not authorized to sell, license, commercially publish, distribute, transmit, display, or record notes from this class unless you have my written consent to do so.

## **STUDENT CONDUCT CODE**

The Student Conduct Code is the official University publication governing student conduct and behavior. It is the responsibility of each student to become familiar with the rules and regulations governing student life. Student conduct procedures, appeal procedures, and disciplinary sanctions are found in the Student Conduct Code at <http://students.georgiasouthern.edu/conduct>. I acknowledge that I have read and understand this statement referencing the Student Conduct Code.

## **ACADEMIC DISHONESTY**

The University goal is to foster an intellectual atmosphere that produces educated, literate people. Because cheating and plagiarism are at odds with that goal, they shall not be tolerated in any form. Students are expected to adhere to the rules and regulations as set forth in the Student Conduct Code. Therefore, all work submitted by a student must represent that student's own ideas and effort; when the work does not, the student has engaged in academic dishonesty. Plagiarism occurs when a person passes in another person's work as his or her own, borrows directly from another person's work without proper documentation, and resubmits his or her own work that has been previously submitted without explicit approval from the instructor. For example, academic dishonesty occurs whenever a student participates in any of the following: Cheating submitting material that is not yours as part of your course performance; using information or devices that are not allowed by the faculty; obtaining and/or using unauthorized materials; fabricating information, research, and/or results; violating procedures prescribed to protect the integrity of an assignment, test, or other evaluation; collaborating with others on assignments without the faculty's consent; cooperating with and/or helping another student to cheat; demonstrating any other forms of dishonest behavior. Plagiarism directly quoting the words of others without using quotation marks or indented format to identify them; using sources of information (published or unpublished) without identifying them; paraphrasing materials or ideas without identifying the source; self-plagiarism - resubmitting work previously submitted without explicit approval from the instructor; unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic material. NOTICE: The list above is intended only to provide general guidelines for recognizing and avoiding common types of academic dishonesty. It is in no way an exhaustive or comprehensive list of all the types of academic dishonesty. For more information about academic honesty, see the Student Conduct Code at <http://students.georgiasouthern.edu/conduct>. I acknowledge that I have read and understand the Academic Dishonesty Policy.

I have read the syllabus and understand the contents and course requirements.

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Student Name (print)

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Student Signature

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Date