Georgia Southern University

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Fall 2021

BIOS 9132 – Advanced Clinical Trial Methodology

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Syllabus: BIOS 9132 – Advanced Clinical Trial Methodology
Jiann-Ping Hsu College of Public Health
Georgia Southern University
1005 Hendricks Hall, 501 Forest Drive, PO Box 8015
Statesboro, GA 30460
Fall 2021

Instructor:	Karl E. Peace
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Phone:	912-478-7905 Office; 912-225-3713 Home, 912-334-1403 Cell
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	peacekarl@frontier.com
Office Hours:	Monday– 5:00 PM – 7:45 PM; **changed from Wednesday to Tuesday** to accommodate Students. Other times by appointment:
	Students are encouraged to make frequent use of email contact where each question will be responded via return email
Class Meets:	Monday – 5:00 PM-to-7:45 PM Fall Semester, 2021

Prerequisites: Clinical Trial Methodology, Statistical Issues in Drug Research and Development, or by permission of instructor.

Catalog Description: Students are introduced to regulatory, scientific, statistical and practical aspects of methods inherent in design, monitoring and analyzing clinical trials. Clinical trials in many areas of drug development are presented, discussed and critiqued.

Required Textbook: No textbook required, although the Clinical Trial Methodology book by Peace and Chen is helpful. The course is presented using power points developed by the professor. Students are provided copies of the power points on a flash drive. Course format is mixed, some inclass, some via zoom

Secondary Texts:

Peace, K. E., Chen, D (2010): Clinical Trial Methodology; Chapman & Hall/CRC, Taylor and Francis Group.

Chen D, Peace KE (2010): Clinical Trial Data Analysis using R; Chapman & Hall/CRC, Taylor and Francis Group; ISBN: 978-1-4398-4020-7

Chen, D, Peace KE: Applied Meta-Analysis using R. Chapman & Hall/CRC, Taylor and Francis Group; 13: 978-1-4665-0599-5; May, 2013.

Chen D, Sun J, Peace KE [Editors and Author contributors] (2012): Interval-Censored Time-to-Event Data: Methods and Applications"; Chapman & Hall/CRC, Taylor and Francis Group; Published July, 2012.

Peace, K. E. [Editor and Author contributor] (2008): *Design and Analysis of Clinical Trials with Time to Event Endpoints;* Chapman & Hall/CRC Taylor and Francis Group; Boca, ISBN 978-1-4200-6639-5.

Peace, K. E. [Editor and Author contributor] (1992): *Biopharmaceutical Sequential Statistical Applications*. Marcel Dekker, Inc., New York, ISBN 0-8247-8628-9.

Peace, K. E. [Editor and Author contributor] (1990): *Statistical Issues in Pharmaceutical Drug Development*. Marcel Dekker, Inc., New York, ISBN 0-8247-8290-9.

Peace, K.E. [Editor and author] (1988): *Biopharmaceutical Statistics in Drug Development*. Marcel Dekker, Inc., New York, ISBN 0-8247-7798-0.

Course Objectives: At the end of this course, students will be able to:

1. Explain the requirements for good protocol development for biomedical research clinical trials and develop the statistical analysis section of such protocols
2. Describe methodological alternatives to commonly used statistical methods used in biomedical research clinical trials when analysis assumptions are not met, and describe prerequisites for validity of inference from clinical trials
3. Interpret results of statistical analyses of data collected from biomedical clinical trials
4. Develop written and oral presentations based on statistical analyses of biomedical research clinical trials, for both biomedical research professionals and educated lay audiences
5. Identify key federal regulations 'governing' the conduct of clinical trials
6. Discuss the Ethics of Clinical Trial Research
7. Describe the components of Population Nonlinear, Mixed Effects Modeling
8. Design, analyze and interpret results of bioequivalence, cancer and non-inferiority clinical trials
9. Describe the issues in group sequential clinical trials and in subset analyses
10. Describe 'intention to treat' and its impact on inference when data are missing and methods of imputing missing data

Instructional Methods: Class meetings will be a combination of lecture and class discussion. All class meetings except the last will be facilitated via in real time (blended format). Homework assignments – including a research project that requires class participation and the final examination constitute the basis of student evaluation.   Students are expected to make use of ample office hours (via Zoom) to discuss concepts or difficulties they may have.

Daily Study Log: Students are required to keep a daily computerized study log. The study log should have a column for the date, a column to identify topic of study, a column to identify the time of beginning study, a column to identify the ending time of study, and a column to identify the amount of time spent in studying the topic.

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

   Final Exam (objectives 1-14, integrated)…………………………………...60%

Homework & Research Project Assignments (objectives 1-14, individually)…..30%
Class Participation (objectives 1-14, individually)…………………………………10%

Total Possible   100%

The following point scale will be utilized in grading:

90% - 100%   A
80% - 90%   B
70% - 80%   C
60% - 70%   D

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.

Academic Misconduct: As a student registered at this University, it is expected that you will adhere to only the strictest standards of conduct.   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.

Academic integrity relates to the appropriate use of intellectual property. The syllabus, lecture notes, and all materials presented and/or distributed during this course are protected by copyright law. Students are authorized to take notes in class, but that authorization extends only to making one set of notes for personal (and no other) use. As such, students are not authorized to sell, license, commercially publish, distribute, transmit, display, or record notes in or from class without the express written permission of the instructor.

Plagiarism: 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.

Attendance Policy: Federal regulations require attendance be verified prior to distribution of financial aid allotments. Students are expected to attend all classes, whether taking for credit or auditing (Instructor will permit missing 1-2 classes for valid reasons).

Inclusiveness: "At Georgia Southern University, we are committed to supporting our students and fostering an environment that is free of bias, discrimination, and harassment in the classroom and in the broader University community. As such, we have an expectation that our learning community is inclusive and respectful. Our diversity may be reflected by differences in race, culture, age, religion, sexual orientation, gender identity, ability, political beliefs, socioeconomic background, and myriad other social identities and life experiences. The goal of inclusiveness, in a diverse community, encourages and appreciates expressions of different ideas, opinions, and

beliefs, so that conversations and interactions that could potentially be divisive turn instead into opportunities for intellectual and personal enrichment.

We are a faculty that strives to model reflection, advocacy, and care for the community in order to work toward an equitable, democratic, and sustainable society. We value your participation in this process. If you feel that our courses, programs, or department fall short of this commitment, we encourage you to engage in dialogue with us."

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. The instructor will make every effort to inform students of changes as they occur. It is the responsibility of the student to know what changes have been made in order to successfully complete the requirements of the course.

Advanced Clinical Trial Methodology Content Modules (Will provide on Flash Drive; modules will also be displayed via ZOOM at beginning of each lecture) to be Covered During the Semester:

1 Ethics of Clinical Research

2 Constructing Statistical Hypotheses from verbal protocol objectives

3.1 P-Values vs CIs

3.2 P-Values: One-sided or two-sided

4 Global Null and Alternative Hypotheses

5. SAP

6 Validity of Statistical Inference from Clinical Trials

7 ACES or Non-inferiority Trials

8 Placebo in Combination Drug Development

9 Safety Assessment – Analysis and summarization

10 Design of Cancer Clinical Trials

11 Population NONMEM of Primary Efficacy Endpoints in AD

12 Biostatistical Aspects of Antianginal Drug Development

13 Intention to Treat in Clinical Trials

14 A Clinical Trial to Establish Reduction in CHD

15 Subgroup Analysis in Clinical Trials

16 An Overview of Multiple Inference Methodology

17 Biostatistical Aspects of Analysis and Interpretation of Cancer Clinical Trials

18 Dosing in the Elderly

19 Pooling of Data in Clinical Trials

20.1 Meta-Analysis Book

Student Information (ADV CTM Class):

Print Full Name	email address	Pledge to spend enough time to master material. Circle one.		

1. _____ _____ Yes   No   Undecided

_____
Signature

2. _____ _____ Yes   No   Undecided

_____
Signature

3. _____ _____ Yes   No   Undecided

_____
Signature

4. _____ _____ Yes   No   Undecided

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Signature