Fall 2019

Syllabus: BIOS 9132 – Advanced Clinical Trial Methodology

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Jiann-Ping Hsu College of Public Health
Georgia Southern University
Hendricks Hall, PO Box 8015
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Fall 2019

Instructor:	Karl E. Peace
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Office Hours:	Wednesday– 3:00 PM – 5:00 PM 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:	Wednesday – 5:00 PM-to-7:45 PM Fall Semester, 2019

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 WebEx

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. Approximately half of the class meetings will be facilitated via Adobe Connect in real time (blended format) and the remainder physically in the classroom. 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 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).

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 to be Covered During the Semester:

Module I: An Overview of the Regulation of Pharmaceuticals - Briefly

Module II: An Overview of the Processes of Discovery, Basic Research, Clinical Development and Manufacturing in Pharmaceutical Development - Briefly

Module IIII: Ethics of Clinical Trial Research

Module IV: Overview of Biostatistical Aspects of Clinical Drug Development - Briefly

A. The Components of a Protocol
B. Statistical Analysis Section of a Clinical Trial Protocol

Module V: Statistical Analysis Plan

Module VI: Validity of Statistical Inference

Module VII: Population Nonlinear, Mixed Effects Modeling of Primary Efficacy Endpoint in Enrichment Trials of Alzheimer's disease

Module VIII: Biostatistical Aspects of the Design of Cancer Trials

Module IX: Biostatistical Aspects of the Analysis and Interpretation of Cancer Clinical Trials

Module X: Interim Analyses: p-Value and Power Computations in Group Sequential Trials

Module XI: Statistical Analysis of Dose Response Trials

Module XII: Safety Assessment in Clinical Trials

Module XIII: Subgroup Analyses in Clinical Trials from a Causal Inference Viewpoint

Module XIV: Statistical Paradigms and Methodologies for Clinical Development

Module XV: Biosimilarity

Module XVI: A Clinical Trial to Reduce CHD Risk

Module XVII: Intention-to-Treat and Inferential Impact of Missing Data

Module XVIII: Methods for Imputing Missing Data

Module XIX: Overview of Meta-Analyses

Module XX: Design and Analysis of Non-inferiority Clinical trials

Module XXI: Sample size of clinical trials premarket approval

Module XXII: Numbers Needed to Treat in Clinical trials

Student Information (ADV CTM Class):

Print Full Name	email address	Pledge to spend enough time to master material? Circle one.		
1. _____	_____	Yes	No	Undecided
2. _____	_____	Yes	No	Undecided