Course Purpose:
This course is designed to introduce pharmacy students to the concepts and methods of biostatistics and study design. The overall goal of the course is for students to develop the ability to critically evaluate the pharmacy and medical literature to identify findings that have implications for their practice.

Course Faculty and Office Hours
Course Coordinator:
Yan Gong, PhD
Office: MSB PG-27, Gainesville Campus, University of Florida, College of Pharmacy.
Office Hours: 3-4 pm on Mondays. Or by apt.
Phone: 352-273-6297
Email: gong@cop.ufl.edu

Co-coordinators:
Carinda Feild, PharmD,
Office: St Pete campus, University of Florida, College of Pharmacy.
Office Hours: By appt.
Phone: 727-394-6213
Email: cfeild@cop.ufl.edu

Paul Doering, M.S.P. Emeritus Distinguished Service Professor
Office: HPNP 3307, Gainesville Campus, University of Florida, College of Pharmacy.
Office Hours: By appt.
Phone: 352-273-6233
Email: doering@cop.ufl.edu

Course facilitators at distant campuses
Jacksonville:
Bernadette S. Belgado, Pharm.D, bernadette.belgado@jax.ufl.edu

Orlando:
John A. Dougherty, MBA, Pharm.D, BCPS, jdougher@nemours.org

St Petersburg:
Carinda Feild, Pharm.D, cfeild@cop.ufl.edu

Teaching Assistant:
Mohamed Shahin, PhD candidate
Office Hours: by appt.
Email: mhossam@ufl.edu
Place and Time of Class Sessions
Live Discussion Sessions Days and Time:

**GNV:** Section 0516: Wednesday, 3:00-3:50 PM (Period 8), HPNP G301
Section 5690: Thursday, 3:00-3:50 PM (Period 8), HPNP G301

**JAX:** Section 0565: Please refer to your campus calendar for day, time, and location
**ORL:** Section 0586: Please refer to your campus calendar for day, time, and location
**STP:** Section 0650: Please refer to your campus calendar for day, time, and location

JAX, ORL and STP students: please refer to your campus calendar for time and locations.

Exam time and GNV location:

- Exam 1: 9/30/2013, Monday, 7-9 pm, HPNP 1404 auditorium
- Exam 2: 11/5/2013, Tuesday, 7-9 pm, HPNP 1404 auditorium
- Final Exam: 12/9/2013, Monday, 9-11 am, HPNP 1404 auditorium

JAX, ORL and STP students: please refer to your campus calendar for exam locations.

How This Course Relates to the Learning Outcomes You Will Achieve in the Pharm.D.
Program:
This course prepares the Pharm.D. students to accomplish the following abilities and the related Student Learning Outcomes (SLOs) upon graduation:

1. Provide Patient-centered Care - Specifically: Design, implement, monitor, evaluate, and adjust pharmacy care plans that are patient-specific; address health literacy, cultural diversity, and behavioral psychosocial issues; are evidence-based and accomplished in collaboration with other health professionals. (SLO 1.1 – Foundational)
2. Provide Population Health by promoting effective drug use and disease prevention/ wellness. (SLO 2.2 – Foundational)
3. Use pharmacy knowledge in the care of patients and resolution of practice problems. (SLO 6.1)
4. Solve complex practice problems (both patient-specific and general practice) using an evidence-based approach, other aspects of good clinical science, and informatics. (SLO 8.3)

Course Objectives
Upon completion of this course, the student will:

- Classify research studies according to type of study design, and identify the particular advantages and disadvantages of common study designs.
- Explain key terms and concepts in statistics that are used in pharmacy and medical journals such as statistical significance, p-value, confidence interval, and power.
- Discern if common statistical tests have been applied and interpreted appropriately in published research.
- Evaluate the statistical portions of most research articles and be able to interpret and apply clinical data when presented in figures and graphs of publications.

Pre-Requisite Knowledge and Skills

2PD College of Pharmacy student.
Course Structure & Outline

Course Structure.

Multiple self-directed learning activities are required. There will be 2 hours of video lecture each week, readings, and weekly live class discussion sessions (eg, case discussion, problem set discussion).

The discussion board is also used. Discussion boards are for sharing questions and getting answers from your peers. This can be a rich source of information about the material in this course. The instructor will be regularly monitoring the discussion boards to assist students. There will be a separate discussion board for each week. Please check ‘welcome to the discussion board’ on the course website for details.

Course Outline/Activities.

See Appendix A for an outline of course activities.

Textbooks and other course supplies

   Available on line at Access pharmacy and Access Medicine database:

2. Articles for discussion: TBA (will be posted on the course website on E-learning system)

Mobile devices

Students are expected to register their mobile devices on the course website through E-learning system and bring their devices to live sessions every week. We intend to administer surveys and quizzes and obtain feedback on course structure on an on-going basis.

Active Learning Requirements

Live discussions

Class will start on time and begin with the quiz (see assessments below). The remainder of the session will be a discussion of the assignment posted for current lecture material. Students are expected to watch the lecture videos before the live discussions and complete the reading assignments (usually journal articles listed) in preparation for the live discussion. Assignments are expected to be worked prior to coming to class. The discussion session is for the purposes of reviewing and clarifying lecture and assignment material.

Student Evaluation & Grading

Evaluation Methods

Exams
There will be three exams given during the semester. The Final Exam is a cumulative examination during Final Examination Week at the end of the semester. Each exam will be closed book and closed notes. Exams will be in a multiple choice format.

Quizzes

There will be a quiz at the beginning of the discussion sections. The quiz will be on the material covered during in the previous week’s lecture. A missed quiz will count as a zero (0) with no make-up available. The quiz with the lowest grade (or one absence) will be dropped from the final quiz grade.

Attendance

Attendance at class sessions is expected. If a student is absent from a class session a zero will be given on attendance. If a student is called upon for class participation they will receive an unprepared if the absence is not excused.

Participation

Students will be randomly called on to answer discussion related questions. Students who are not prepared will receive a 0 for that participation performance. The performance scores will be averaged to determine the participation grade for the course.

The course grade will be determined as follows:

- Exam 1 25%
- Exam 2 25%
- Final Exam 30%
- Attendance 5%
- Quizzes 8%
- Participation on the discussion 7%

Grading Scale

Final Grade will be rounded to the closest integer and letter grade will be assigned as follows:

- 93-100: A
- 90-92: A-
- 87-89: B+
- 83-86: B
- 80-82: B-
- 77-79: C+
- 73-76: C
- 70-72: C-
- 67-69: D+
- 63-66: D
- 60-62: D-
- < 60: E

Quiz/Exam Policy
Students may take their exams with them. The students have 5 days from the time exam results become available to submit questions or queries. The keys to the exams will be posted after the exam.

**Make-up Quiz/Exam Policy**
A missed quiz will count as a zero (0) with no make-up available. The quiz with the lowest grade (or one absence) will be dropped from the final quiz grade.

Make-up for a missed exam is at the discretion of the course coordinator, if the coordinator is notified in advance and will only be permitted in the case of an excused absence.

**Policy on Old Quizzes and Assignments**
Exams from the previous years will be posted on the course website.

**Assignment Deadlines**
Not applicable.

**General College of Pharmacy Course Policies**
The College of Pharmacy has a website that lists course policies that are common to all courses. This website covers the following:

1. University Grading Policies
2. Academic Integrity Policy
3. How to request learning accommodations
4. Faculty and course evaluations
5. Student expectations in class
6. Discussion board policy
7. Email communications
8. Religious holidays
9. Counseling & student health
10. How to access services for student success

Please see the following URL for this information:

**Complaints**
Should you have any complaints with your experience in this course please visit:

**Other Course Information**
[Use Appendices to include other course information such as:

1. Directions of assignments
2. Rubrics that will be used to evaluate performance
3. Additional course policies ]
# Appendix A. Course Schedule Fall 2013

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Readings*</th>
<th>Discussion Topic</th>
<th>Quiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Aug 21 - 23)</td>
<td>Introduction to course and why statistics</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2 (Aug 26-30)</td>
<td>Basic Study Designs</td>
<td>ch 2</td>
<td>Entrance survey and study designs</td>
<td>survey, no quiz</td>
</tr>
<tr>
<td></td>
<td>Reading the Medical Literature 1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3 (Sep 2 - 6)</td>
<td>Descriptive Statistics 1</td>
<td>ch 3</td>
<td>Descriptive statistics, article TBC</td>
<td>study designs</td>
</tr>
<tr>
<td></td>
<td>Descriptive Statistics 2</td>
<td>ch 3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4 (Sep 9-13)</td>
<td>Probability and Statistical Inference 1</td>
<td>ch 4</td>
<td>Probability and distributions</td>
<td>descriptive statistics</td>
</tr>
<tr>
<td></td>
<td>Probability and Statistical Inference 2</td>
<td>ch 4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5 (Sep 16-20)</td>
<td>t test on 1 group</td>
<td>ch 5</td>
<td>t test and proportion examples, article TBD</td>
<td>probability</td>
</tr>
<tr>
<td></td>
<td>Proportion on 1 group</td>
<td>ch 5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6 (Sep 23 - 27)</td>
<td>t test &amp; chi-square test: 2 groups (exam 1 cutoff)</td>
<td>ch 6</td>
<td>2 sample t test, chi-square test, article TBD</td>
<td>t test and proportion on 1 group</td>
</tr>
<tr>
<td></td>
<td>ANOVA 1</td>
<td>ch 7</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7 (Sep 30-Oct 4)</td>
<td>Exam 1 on 9/30, Monday, 7-9 pm</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8 (Oct 7 - 11)</td>
<td>ANOVA 2</td>
<td>ch 7</td>
<td>ANOVA</td>
<td>2 sample t test and chi-square test</td>
</tr>
<tr>
<td></td>
<td>Correlation</td>
<td>ch 8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>9 (Oct 14 - 18)</td>
<td>Linear regression</td>
<td>ch 8</td>
<td>ANOVA</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Multiple regression</td>
<td>ch10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10 (Oct 21- 25)</td>
<td>ANCOVA</td>
<td>ch10</td>
<td>multiple regression article: TBD</td>
<td>correlation and regression</td>
</tr>
<tr>
<td></td>
<td>Survival Analysis 1</td>
<td>ch 9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>11 (Oct 28- Nov 1)</td>
<td>Survival Analysis 2 (exam 2 cutoff)</td>
<td>ch 9</td>
<td>Survival analysis article TBD</td>
<td>multiple regression</td>
</tr>
<tr>
<td></td>
<td>Categorical Data analysis 1</td>
<td>ch10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>12 (Nov 4 - 8)</td>
<td>Exam 2 on 11/5, Tuesday, 7-9 pm</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>13 (Nov 11 - 15)</td>
<td>Categorical Data analysis 2</td>
<td>ch10</td>
<td>logistic regression, Power &amp; sample size</td>
<td>survival analysis</td>
</tr>
<tr>
<td></td>
<td>Power and sample size calculation</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>14 (Nov 18-22)</td>
<td>Reading the Medical Literature 2</td>
<td>-</td>
<td>meta analysis</td>
<td>logistic regression &amp; power</td>
</tr>
<tr>
<td></td>
<td>Meta-analysis</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>15 (Nov 25-29)</td>
<td>Superiority, Equivalence and non-inferiority trials</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>16 (Dec 2-4)</td>
<td>Intro to Methods of Evidence-Based medicine</td>
<td>ch12</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>17 (final exam)</td>
<td>Final exam on 12/9, Monday, 9-11 am</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Chapters refer to Basic & Clinical Biostatistics, 4th edition by Dawson and Trapp. We expect that chapters are read *prior* to coming to class.