College of Charleston
EXSC 433-03 Research Design and Analysis
Fall 2013  3 Semester Credit Hours

TIME & PLACE: T-R 1:40-2:55 pm; Room 146
Silcox Physical Education & Health Center

INSTRUCTOR: Miriam Klous, Ph.D.

OFFICE HOURS: T-R 3:00-5:30 PM or by appointment

OFFICE: Room 309 Silcox Physical Education & Health Center

PHONE/FAX: (843) 953 5565 / (843) 953 6757

EMAIL: klousm@cofc.edu

PREREQUISITE: EXSC 330, 340; MATH 104 or 250; or permission of the instructor


COURSE DESCRIPTION: This class will focus on data collection and interpretation in health and exercise science, including common physiological, biomechanical, anatomical, and health-related variables. Emphasis is placed on the development of a clinical research question and the appropriate procedures to further the body of knowledge in the area of health and exercise science.


COURSE OBJECTIVES: This course will provide information and experiences designed to make undergraduate College of Charleston HEHP students better consumers of research. It will allow them to effectively plan a (research) project. This overarching goal will be achieved by providing information through lecture, group activities, demonstrations, discussions, simple data collection and analysis, debates, and other activities. Specifically, this course will:

1. Provide students with an understanding of the research process and research design.
2. Help students develop a healthy skepticism about research and research quality by showing the strengths and
limitations of the research and statistical analysis processes.
3. Demonstrate skills used in statistical analysis and interpretation and give sufficient practice with these procedures.
4. Provide an understanding of and practice with, ethical issues in research.
5. Provide information about effective scientific writing and an opportunity to practice scientific writing.

**STUDENT LEARNING OUTCOMES:**
Upon successful completion of the course, the student should be able to:
1. Define common research designs used in exercise science, health, athletic training, and medicine.
2. Describe the positive and negative characteristics of various research designs.
3. Assess and optimize validity and reliability of variables used in health and exercise science.
4. Develop a research question and appropriate experimental hypothesis for the student’s specific sub-discipline of interest.
5. Perform a thorough literature search using contemporary search engines.
6. Make appropriate ethical decisions in research, including the use of special populations as research participants while involved in physical exertion.
7. Have a conceptual understanding of and be able to perform basic statistical procedures
   a. Descriptive statistics
   b. Inferential statistics
8. Interpret statistical output and understand the implications associated with generalizability.
9. Write a research/grant proposal using a common style specified by a peer-reviewed journal in his or her sub-discipline.

**TENTATIVE GRADING:**

| Unit 1: Introduction to research & research ethics | 30% |
| Video, comic strip, CITI training (see below) |

| Unit 2: Statistics | 30% |
| Exam #1 (Chapters 7-12) |
| Quizzes and homework |

| Unit 3: Research writing | 30% |
| Research/grant proposal (see below) |

| Throughout the semester | 10% |
| Online quizzes |

Final grade will be calculated using the formula:

\[0.15 \cdot \text{video} + 0.10 \cdot \text{comic strip} + 0.05 \cdot \text{CITI training} + 0.20 \cdot \text{exam statistics} + 0.10 \cdot \text{average grade quizzes statistics} + 0.21 \cdot \text{grade research grant proposal} + 0.09 \cdot \text{presentation grant proposal} + 0.10 \cdot \text{average grade online quizzes}\]
GRADED ITEMS:

1. Unit 1 (30%): You are expected to create a video, to make a comic strip, and to have a valid CITI training.
   a. Video (15%) - (groups of 4)
      Topic: ‘How are we consumers of research?’
      Task: Create a video that shows in what way we are all consumers of research
      Audience: own choice
      Length of video: 5 – 7 minutes
      Format: .MP4, .MWV
   b. Comic strip (10%) – (groups of 4)
      Topic: Science or science fiction??
      Task: create a comic strip that shows how a current fundamental research topic (topics provided in class, or you can pick your own topic) can have a great influence on society in the future
      Audience: own choice
      Length of comic strip: >15 frames
   c. CITI training (5%)
      If not already done in EXSC 210, you have to take the CITI training online. You are required to have a valid CITI training. If you have a valid CITI training, email me a copy of the certification. Details will be provided in class.

2. Unit 2 (30%)
   a. Written exam (20%)
      There will be 1 written exam covering the statistics. The format of the examination will be problem solving, critical thinking, and multiple choice format.
   b. Quizzes (10%)
      In preparation for the exam there will be several possibilities to test your knowledge through smaller quizzes

3. Unit 3 (30%)
   a. Research/grant proposal including presentation (21%)
      You will write a research/grant proposal in groups of two about a topic of your choice. Those involved in an independent study in the fall ’13 or the spring ’14 or in a research capstone in the spring ’14 will make that the topic of their research/grant proposal. Detailed instructions for the research/grant proposal will be posted on OAKS throughout the semester.
The research/grant proposal contains:

Written proposal of 8-10 double-spaced pages, TNR 12, references not included (225 points)

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Title</td>
<td>15</td>
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<tr>
<td>Abstract/project summary</td>
<td>30</td>
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<tr>
<td>Introduction</td>
<td>60</td>
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<tr>
<td>Statement of the problem</td>
<td>(20)</td>
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<tr>
<td>Review of the literature</td>
<td>(25)</td>
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<tr>
<td>Goal and research question/hypothesis</td>
<td>(15)</td>
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<tr>
<td>Materials and Methods</td>
<td>80</td>
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<td>Subjects</td>
<td>(20)</td>
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<td>Instrumentation</td>
<td>(20)</td>
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<td>Experimental setup and procedures</td>
<td>(25)</td>
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<tr>
<td>Data processing</td>
<td>(15)</td>
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<tr>
<td>References</td>
<td>20</td>
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<tr>
<td>Format and Followed Directions</td>
<td>20</td>
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</tbody>
</table>

The research/grant proposal has to be turned in the starting day of the presentation at **Tuesday November 19, 2013** before the beginning of class.

b. **Presentation of grant proposal (9%)**

Oral presentation (100 points): 10 min. presentation of your research/grant proposal with 5 min. questions

3. **Online quizzes (10%)**: The quizzes will be provided on OAKS the day before class and have to be before midnight (deadline: 11:59 PM) as preparation for the class next day.

**EVALUATION SCALE:**

- A = 90-100%
- A- = 88-89%
- B+ = 85-87%
- B = 80-84%
- B- = 78-79%
- C+ = 75-77%
- C = 70-74%
- C- = 68-69%
- D+ = 66-67%
- D = 64-65%
- D- = 62-63%
- F = <62

**CAPSTONE:**

The Capstone Experience in Exercise Science (EXSC 498) class offered in the spring semester will be taught in a mini-seminar format by the Exercise Science professors from the Department of Health and Human Performance. Individual students that have secured the support of a faculty research mentor can request to opt out of the Capstone Seminar class and replace it with their faculty-mentored research project in the form of a Research Capstone. This will be done on a case by case review and approval process.

Additional to the Research Capstone, since students are encouraged to engage in research at the College of Charleston this
can be accomplished through completing an independent study (EXSC 401). Independent study options will allow students to be involved in campus or community-based activities such as fitness/wellness instructors, fitness assessments, C-PARCS (Community Wellness program), Autism project, Louie’s Kids, Franke Home at Seaside and others. In case the student chooses an Independent Study, the student still has to attend the Capstone Seminar. It is possible to choose a research project that combines an independent study with the research capstone (as long as it covers the number of credit hours). It is the student's own responsibility to find a faculty mentor for the research capstone or an independent study or to sign up for one of the pre-set research capstone / independent study opportunities developed by faculty members.

**ATTENDANCE POLICY:**

Attendance is expected and strongly recommended. Attendance will be taken randomly. In case of absence, the quizzes or submission of homework assignments that are announced or unannounced cannot be retaken/resubmitted in case of unexcused absence and the student will receive 0 points. For an excused absence appropriate documentation must be provided from the Undergraduate Dean’s Office. In case of absence, you will be held responsible for the class material covered during your absence.

**EXAMINATION AND MAKE-UP POLICY:**

You will be notified at least one week in advance if there is a change in an exam date. Exams must be taken on the day assigned unless arrangements are made prior to the test date. All make up exams must be made up within one week of the original exam date. It is the students’ responsibility to make the necessary arrangements. If a student is absent on the day of an exam, he/she will receive a zero if the professor is not notified before class time. In case of taking a make-up exam, the professor reserves the right to give you a different exam.

**ASSIGNMENT POLICY:**

All assignments are due at the beginning of class (1:40 pm) on the day they are due. Assignments can be submitted in hard copy or electronic copy to the instructor. If a copy is not received on time, 1 point will be subtracted for each hour the assignment is submitted late in the first 12 hours. After these 12 hours, 3 additional points will be subtracted for each 24 hours the assignment is submitted late (when submitting an assignment 13-37 hours late, you will lose 12 + 3 = 15 points).
ELECTRONIC DEVICE POLICY: Please turn off the sound of all electronic devices during class. NO TEXT MESSAGING or other forms of electronic communication permitted. Laptops are allowed to be used in class to make notes. Bring a calculator to class, cellphones, tables, and notebooks are not allowed as calculator at any time. Only non-programmable calculators will be allowed during exams: please plan accordingly.

PROVISIONS FOR STUDENTS WITH SPECIAL NEEDS:

The College of Charleston and I are committed to the full inclusion of all students. Students who have a documented disability and require academic accommodations should contact the instructor. Please do so during the first week of class of any accommodations needed for the course.

COLLEGE OF CHARLESTONS HONOR CODE AND ACADEMIC INTEGRITY:

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student’s actions are related more to a misunderstanding will handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student’s file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student’s transcript for two years after which the student may petition for the X to be expunged. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration—working together without permission—is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others’ exams, fabricating data, and giving unauthorized assistance.

Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor.

Students can find the complete Honor Code and all related processes in the Student Handbook at http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php
TENTATIVE COURSE OUTLINE

*It is expected that in preparation for your class you take the online quiz of the chapter that will be discussed in class the following day*

**Week 1** Intro, general, Syllabus;
  - Introduction to research (Chapter 1)
  
  August 20
  August 22

**Week 2** Introductory concepts - Ethics in Human Subject Research (Chapter 2)
  - Statistics - Basic statistical concepts (Chapter 7)
  
  August 27: **deadline CITI training**
    - Eileen Callahan CofC Compliance Officer
  
  August 29

**Week 3** Statistics - Basic statistical concepts (Chapter 7) (cont.)
  - Statistics - Central tendency, variability, and the normal curve (Chapter 8)
  
  September 3: **provide storyboard/script for video & comic strip**
  
  September 5

**Week 4** Statistics - Central tendency, variability, and the normal curve (Chapter 8) (cont.)
  - Statistics - Probability and hypothesis testing (Chapter 9)
  
  September 10
  September 12

**Week 5** Statistics - Probability and hypothesis testing (Chapter 9) (cont.)
  
  September 17
  September 19: **feedback from peers on video & comic strip**

**Week 6** Statistics - Probability and hypothesis testing (Chapter 9) (cont.)
  
  September 24
  September 26: **video & comic strip presentations**

**Week 7** Statistics - Relationships and predictions (Chapter 10)
  - Statistics - Comparisons of mean scores? (Chapter 11)
  
  October 1: **topic & partner research paper due**
  
  October 3
Week 8 Statistics - Comparisons of mean scores? (Chapter 11) (cont.)
Statistics – Selected nonparametric tests (Chapter 12)
October 8
October 10

Week 9 Review exam 2
October 15: Fall Break
October 17

Week 10
October 22: exam unit 2
October 24

Week 11 Research Writing – Information retrieval (Chapter 3)
Research Writing – The research paper and proposal (Chapter 4)
October 29: Bring the literature for your research paper to class and set up an outline for the Introduction and develop a title
October 31: Discuss the method section with your partner

Week 12 Research Writing – Results, discussion, conclusion, and references (Chapter 5)
November 5: Feedback from peers on Title and Introduction
November 7: Discuss the implementation and lay-out of graphs and tables in your Methods

Week 13 Research Writing – Research writing (Chapter 6)
November 12: Feedback from peers on Methods
November 14: Feedback from peers on Abstract

Week 14 Presentations
November 19: Research paper due, Presentations of research papers
November 21: Presentations of research papers

Week 15 Presentations
November 26: Presentations of research papers
November 28: Thanksgiving holiday

Week 16
Presentations of research papers will be during class time
No final exam in the exam week