

**PHAR 6015**  
**Effects, Power, Meta-Analysis**

Fall 2016

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**CLASS DAYS and TIME:** 1 hour per week, on a day and time decided by the students and faculty

**CLASSROOM:** to be determined based on the number of students

**COURSE FACULTY:** Wouter Koek, Ph.D., Course Director

**OFFICE LOCATION and HOURS:** By appointment; Office 741E5

**EMAIL:** koek@uthscsa.edu

**TELEPHONE:** 567-3968

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**READ THIS DOCUMENT CAREFULLY - YOU ARE RESPONSIBLE FOR ITS CONTENTS.**

#### **COURSE DESCRIPTION AND OBJECTIVES**

Evaluating the statistical significance of research findings requires knowledge of statistics, but additional skills are needed to evaluate their importance. This course introduces tools that help answer three questions: 1) How do I assess the practical or everyday significance of my research results, 2) Does my study have sufficient power to find what I am seeking, and 3) How do I draw conclusions from past studies reporting disparate results. Answering these questions involves estimation of effect size, calculation of statistical power, and pooling of individual effect size estimates by meta-analysis. This course discusses these activities together, because they are interrelated. A well-designed study is normally based on a prospective power analysis, and a good power analysis will ideally be based on a meta-analytically derived mean effect size. There is a growing recognition by scientific journals and funding agencies of the need to report effect sizes along with the results of test of statistical significance and to quantify the statistical power of studies. The aim of this course is to help acquire the skills necessary to meet these needs.

**Pre-requisites** – This micro-elective builds on the significance-testing and power analytic skills that students learn in CSBL 5095 – Experimental Design and Data Analysis. Thus, having taken CSBL 5095 is a prerequisite for this course.

**Semester credit hours** – 1

By the end of this course, each student should be able to:

- There is a growing recognition by scientific journals and funding agencies of the need to report effect sizes along with the results of test of statistical significance and to quantify the statistical power of studies. The aim of this course is to help acquire the skills necessary to meet these needs..

#### **COURSE ORGANIZATION**

**The main teaching modalities used in this course include:**

**1) Discussions.** After the first introductory class, during each meeting one of the students presents the required reading assignment (shown below) for discussion by the class and the instructor. During the last two meetings, students will use data they bring to calculate effect sizes, power, and confidence intervals, and to conduct meta-analysis.

**Materials** – Software: ESCI-for-Excel, G\*Power (freely available on-line downloads, Windows and Macintosh versions).

**Computer Access** – Presentations require access to a computer with Microsoft Office, ESCI-for Excel, and G\*Power.

## Reading Assignments –

Day	Topic	Readings*
1	Introduction and Class Overview	
2	Introduction to effect sizes	pp. 1-15
3	Introduction to effect sizes	pp. 16-30
4	Interpreting effects	pp. 31-44
5	Power analysis and the detection of effects	pp. 45-55
6	Power analysis and the detection of effects	pp. 56-72
7	The painful lessons of power research	pp. 73-85
8	Drawing conclusions using meta-analysis	pp. 89-101
9	Drawing conclusions using meta-analysis	pp. 101-115
10	Minimizing bias in meta-analysis	pp. 116-126
11	Minimizing bias in meta-analysis	pp. 127-133
12	Last word: thirty recommendations for researchers	pp. 134-137
13	Software to calculate effects sizes and power	bring your own data
14	Software to calculate confidence intervals and conduct meta-analysis	bring your own data

\* from required textbook: Ellis, Paul. *The Essential Guide to Effect Sizes*. Cambridge University Press, 2010

## **ATTENDANCE**

In order to achieve the expected level of competency, students must be fully engaged. Therefore, attendance for every class session is expected.

## **TEXTBOOKS**

**Required:** Ellis, Paul. *The Essential Guide to Effect Sizes*. Cambridge University Press, 2010

## **GRADING POLICIES AND EXAMINATION PROCEDURES**

A maximum of 100 points can be obtained by attendance and participation in the discussions (maximum 40 points) and by presenting the readings (maximum 60 points).

### Grading System

Grading scale used to determine final grades: A = 90-100%      B = 80-89%      C = 70-79%      F = < 69%

## **REQUESTS FOR ACCOMODATIONS FOR DISABILITIES**

In accordance with policy 4.2.3, **Request for Accommodation Under the ADA and the ADA Amendments Act of 2008 (ADAAA)**, any student requesting accommodation must submit the appropriate request for accommodation under the American with Disabilities Act (ADA, form 100) to his/her appropriate Associate Dean of their School and a copy to the ADA Coordinator. Additional information may be obtained at <http://uthscsa.edu/eeo/request.asp>.

## **ACADEMIC INTEGRITY AND PROFESSIONALISM**

Any student who commits an act of academic dishonesty is subject to discipline as prescribed by the UT System Rules and Regulations of the Board of Regents. Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an exam for another person, signing attendance sheets for another student, and any act designed to give unfair advantage to a student or the attempt to commit such an act. Additional information may be obtained at <http://catalog.uthscsa.edu/generalinformation/generalacademicpolicies/academicdishonestypolicy/>

## **TITLE IX AT UTHSCSA**

### **Title IX Defined:**

Title of the Education Amendments of 1972 is a federal law that prohibits sex discrimination in education. It reads “no person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance.”

### **University of Texas Health Science Center San Antonio’s Commitment:**

University of Texas Health Science Center San Antonio (UTHSCSA) is committed to maintaining a learning environment that is free from discriminatory conduct based on gender. As required by Title IX, UTHSCSA does not discriminate on the basis of sex in its education programs and activities, and it encourages any student, faculty, or staff member who thinks that he or she has been subjected to sex discrimination, sexual harassment (including sexual violence) or sexual misconduct to immediately report the incident to the Title IX Director.

In an emergency, victims of sexual abuse should call 911. For non-emergencies, they may contact UPD at 210-567-2800. Additional information may be obtained at <http://students.uthscsa.edu/titleix/>

## **EMAIL POLICY**

Every student is issued a University e-mail address and account at the time of enrollment. As a matter of University Policy, communications between students and faculty that occur using the student’s University e-mail address is considered official business. Therefore, students are expected to check their university email inboxes on a regular basis so that any announcements, instructions, or information regarding this course will be received in a timely way.

## **USE OF RECORDING DEVICES**

Recording of lectures and other learning activities in this course by any means (e.g., video, audio, etc.) is only permitted if approved by the instructor or required for compliance with Americans with Disabilities Act (ADA).

## **ELECTRONIC DEVICES**

Cell phones must be turned off during all class meetings and exams. Computers and electronic tablets are allowed only for participating in classroom activities (e.g., viewing slides presented in lecture or conference materials). No texting, tweeting, emailing, web-surfing, gaming, or any use of electronic devices that is not directly connected with classroom activities is permitted.

**TENTATIVE CLASS SCHEDULE**  
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**Fall 2016**

WEEK	DATE	TOPIC	Assignment*	Presenter
<b>Week 1</b>		Introduction and Class Overview		<b>instructor</b>
<b>Week 2</b>		Introduction to effect sizes	pp. 1-15	<b>student</b>
<b>Week 3</b>		Introduction to effect sizes	pp. 16-30	<b>student</b>
<b>Week 4</b>		Interpreting effects	pp. 31-44	<b>student</b>
<b>Week 5</b>		Power analysis and the detection of effects	pp. 45-55	<b>student</b>
<b>Week 6</b>		Power analysis and the detection of effects	pp. 56-72	<b>student</b>
<b>Week 7</b>		The painful lessons of power research	pp. 73-85	<b>student</b>
<b>Week 8</b>		Drawing conclusions using meta-analysis	pp. 89-101	<b>student</b>
<b>Week 9</b>		Drawing conclusions using meta-analysis	pp. 101-115	<b>student</b>
<b>Week 10</b>		Minimizing bias in meta-analysis	pp. 116-126	<b>student</b>
<b>Week 11</b>		Minimizing bias in meta-analysis	pp. 127-133	<b>student</b>
<b>Week 12</b>		Last word: thirty recommendations for researchers	pp. 134-137	<b>student</b>
<b>Week 13</b>		Software to calculate effects sizes and power	bring your own data	<b>instructor</b>
				<b>students</b>
<b>Week 14</b>		Software to calculate confidence intervals and conduct	bring your own data	<b>instructor</b>
		meta-analysis		<b>students</b>

\* Reading from required textbook: Ellis, Paul. The Essential Guide to Effect Sizes. Cambridge University Press, 2010