HCC

HOUSTON COMMUNITY COLLEGE

Course Syllabus
Statistical Methods in Psychology
PSYC 2317

Semester with CRN	Spring 2015, CRN 44753
Instructor contact information **Phone number** **email addresses**	Charles Earley, J.D., M.A. 409-939-3505 Charles@vintagegalvez.com (checked most often) Charles.earley@hccs.edu
Office Location and Hours	Office hours are in class, before class or after class. I am available at other times by appointment
Course Location Times	Southeast College, Angela Morales Building, Room 307 Thursdays, 9:30am-11:00am
Course Semester Credit Hours	Credit Hours 3.00 Lecture Hours 3.00
Total Course Contact Hours	48.00
Course Length (number of weeks)	16 weeks
Type of Instruction	Lecture and online various assigned readings from textbooks, peer-reviewed articles, books, original source seminal texts and other original source material, films, field trips, etc.
Course Description:	An introduction to the use of scientific methods in psychology and to the statistical analysis of data. Attention is given to descriptive, correlational, and inferential statistical methodology.
Course Prerequisite(s)	**PREREQUISITE(S):** • MATH 0312 • Must be placed into college-level reading (or take GUST 0342 as a co-requisite) and • be placed into college-level writing (or take

ENGL 0310/0349 as a co-requisite)

FREQUENT REQUISITES

- ENGL 0310 or 0349
- College Level Writing
- GUST 0342 (9th -11th Grade Reading)
- College Level Reading

Academic Discipline/CTE Program Learning Outcomes	1. Succeed in advanced psychology courses that include related content and are required for an undergraduate major in psychology. 2. Succeed in advanced psychology and psychology-related courses that include related content and are required in non-psychology majors such as nursing and education. 3. Understand and evaluate psychological concepts that are covered in this course and are featured in news reports, self-help materials, and as a part of the process of seeking and engaging in psychotherapy.
Course Student Learning Outcomes (SLO)	1. 1. Define and identify basic general concepts in statistics. 2. 2. Describe and explain concepts and procedures of descriptive statistics. 3. 3. Describe and explain probability theory and hypothesis testing procedure. 4. 4. Describe, explain, and compare various inferential statistical procedures.
Learning Objectives	**1. Define and identify basic general concepts in statistics.** 1. 1.1. CORE DOMAIN 1: General Statistical Concepts and Terminology Define 1.1.1. Statistics 1.1.2. Population 1.1.3. Sample 1.1.4. Parameter 1.1.5. Statistic 1.1.6. Descriptive statistics 1.1.7. Inferential statistics 1.1.8. Sampling errors 1.2. CORE DOMAIN 2: Methodology Define 1.2.1. The correlational method 1.2.2. The experimental method 1.2.3. Nonexperimental methods (quasi-experimental method) 1.3. CORE DOMAIN 3: Variables and Measurement Define 1.3.1. Discrete variable

1.3.2. Continuous variable

1.3.3. Real limits

1.3.4. Scales of measurement

1.3.5. The nominal scale

1.3.6. The ordinal scale

1.3.7. The interval scale

1.3.8. The ratio scale

1.3.9. Summation notation (upper case sigma, for summation)

2. Describe and explain concepts and procedures of descriptive statistics.

1. 2.1. CORE DOMAIN 1: Frequency Distributions
Describe and explain the procedure to construct

2.1.1 Frequency distribution tables

2.1.2. Frequency distribution graphs

2.1.3. Histograms

2.1.4. Polygons

2.1.5. Bar graphs

2.2 CORE DOMAIN 2: The Shape of a Frequency Distribution
Describe

2.2.1. Symmetrical distribution

2.2.2. Positively skewed distribution

2.2.3. Negatively skewed distribution

2.3 CORE DOMAIN 3: : Central Tendency
Describe and explain

2.3.1. Central tendency

2. 3.2. Types of central tendency

2.3.3. Features of the mean

2.3.4. Features of the median

2.3.5. Features of the mode

2.4. CORE DOMAIN 4: : VARIABILITY
Describe and explain

2.4.1. Variability

2. 4.2 Ranges

2.3.2. Interquartile Range

2.3.4. Variance

2.3.5. Standard deviation

2.5 CORE DOMAIN 5: Z-Scores (Standardized Scores)
Describe and explain

2.5.1. Z Scores, formula and application

2.5.2 Features of the Z distribution

2.5.2. Other standardized distributions based on z-scores

3. Describe and explain probability theory and hypothesis testing procedure.

1. 3.1. CORE DOMAIN 1: Probability
Describe and explain the computation of

3.1.1 Probability

3.1.2. Probability in a normal distribution (using the Unit Normal Table)

3.1.3. The Sampling Distribution of the mean

3.2. CORE DOMAIN 2: Sampling and Probability
Describe and explain

3.2.1. The distribution of sample means
3.2.2. The central limit theorem
3.2.3. The expected value of the sample means
3.2.4. The standard error
3.3 CORE DOMAIN 3: Hypothesis Testing
Describe and explain
3.3.1. Hypothesis testing steps
3.3.2. Types of hypotheses: Null and Alternative
3.3.3. Nondirectional (two-tailed) and Directional (one-tailed) tests
3.3.4. Region of rejection or critical values as a criterion
3.3.5. Types of decision: Reject and Fail to reject null hypothesis.
3.3.6. Type I errors
3.3.7. Type II error
3.3.8. Statistical Power
3.3.9. Effect size (Cohen's d)

4. Describe, explain, and compare various inferential statistical procedures.
1. 4.1 CORE DOMAIN 1: Single-Sample t test
Describe and compute
4.1.1. The single t test and it's assumptions
4.1.2. The t formula
4.1.3. The t distribution
4.1.4. Degrees of Freedom
4.1.5. Effect size
4.2. CORE DOMAIN 2: The t test for independent samples
Describe and compute
4.2.1. The independent t test
4.2.2. The pooled variance
4.2.3. Effect size
4.2.4. Homogeneity of variance assumption
4.3. CORE DOMAIN 3: The t test for related samples
Describe and compute
4.3.1. The t for related samples.
4.3.2. Repeated-measures design
4.3.3. Matched-subjects design
4.3.4. Pros and cons of repeated-measures design
4.3.5. Effect size
4.4 CORE DOMAIN 4: Estimation
Define and interpret
4.4.1. Purpose of Estimation
4.4.2. Point Estimation
4.4.5. Confidence Intervals
4.4.6. Estimation based on single-sample t
4.4.7. Estimation based on independent-measures t
4.4.8. Estimation based on related sample t
4.5 CORE DOMAIN 5: Analysis of Variance (ANOVA)
Explain and compute:
4.5.1. ANOVA: The F test and its assumptions
4.5.2. F Distribution
4.5.3. Types of degrees of freedom: Between and Within

4.5.4. Types of Sum Squares: Between and Within
4.5.5. Types of Mean Squares: Between and Within
4.5.6. The ANOVA summary table, SSs, DFs, F5
4.6. CORE DOMAIN 6: Correlation
Explain and describe:
4.6.1. Pearson's r
4.6.2. Types of correlations
4.6.3. Hypothesis testing with r
4.7. CORE DOMAIN 7: Regression
Explain and compute:
4.7.1. Regression and regression line
4.7.2. The least-squares solution
4.7.3. Coefficient of determination
4.7.4. Standard error of estimate

Instructional Methods

Hybrid (50% or less)

Student Assignments

Homework and a major project will allow students to be able to:
1. Define and identify basic general concepts in statistics.
2. Describe and explain concepts and procedures of descriptive statistics.
3. Describe and explain probability theory and hypothesis testing procedure.
4. Describe, explain, and compare various inferential statistical procedures.

Homework and Class work
Homework is all odd problems in the text, and it is helpful to read the chapter and attempt the problems before the class in which that chapter is discussed. Answers to all of the odd problems are in the back of the book, so homework is not graded, although it should be turned in because credit is given for working the problems. Homework and exams will be returned within one week of submission.

Class work will be assigned online for the student to complete. These assignments are located on the Eagle Online site for this course.

RESEARCH ASSIGNMENT
There will be a research assignment that is a major part of this class. All projects will be entered in the PSYC Fair competition. Specifics of the project will be included in the PSYC Fair handout and on the Blackboard site for this class.

For this study, you must develop and complete a research project utilizing data that are already available. This will include a poster presentation and a completed manuscript in APA format.

Student Assessment(s)	**The three exams and final are designed to test the student's ability to:** **1. Define and identify basic general concepts in statistics.** **2. Describe and explain concepts and procedures of descriptive statistics.** **3. Describe and explain probability theory and hypothesis testing procedure.** **4. Describe, explain, and compare various inferential statistical procedures.** Exams will consist primarily of problems that test your ability to understand statistical concepts and the ability to analyze data.
Instructor's Requirements	As your Instructor, it is my responsibility to: • Provide the grading scale and detailed grading formula explaining how student grades are to be derived • Facilitate an effective learning environment through class activities, discussions, and lectures • Description of any special projects or assignments • Inform students of policies such as attendance, withdrawal, tardiness and make up • Provide the course outline and class calendar which will include a description of any special projects or assignments • Arrange to meet with individual students before and after class as required To be successful in this class, it is the student's responsibility to: • Attend class and participate in class discussions and activities • Read and comprehend the textbook • Complete the required assignments and exams • Ask for help when there is a question or problem • Keep copies of all paperwork, including this syllabus, handouts and all assignments • Complete the field study with a 70% passing score **Scholastic Honesty** The instructor and the College expect academic honesty. The general discipline provisions provided by HCCS with reference to academic dishonesty will be followed *(HCCS Student Handbook.)* Academic dishonesty will result in an F in the class for all parties involved and the

recommendation for dismissal from the College. Do not use a mobile phone during an exam. Use of a mobile phone during an exam shall be considered cheating. THERE WILL BE NO EXCEPTIONS TO THIS RULE. PLEASE BE AWARE OF WHAT PLAGIARISM AND CHEATING ARE SO YOU CAN AVOID THIS SEVERE PENALTY.

Expectations of Civil Conduct

Students are expected to conduct themselves professionally in their communication with the instructor, their classmates, and college staff and administration. Behavior inappropriate to the collegiate setting (including but not limited to abusive/derogatory/threatening/harassing language directed at the instructor or towards other students, staff or administrators) will not be tolerated, and may result in removal from the course if severe and/or repeated.

Attendance and Drop Policy

Class attendance is imperative to make a good grade in this course. Participation is a vital part of this class, and missing class will mean that you have missed information that may be important for the exams. You are responsible for the material regardless of whether you attend class, and do not expect the instructor to review material again if you are late to class. The instructor has an obligation to all of the students in the class and cannot take class time to cover material missed due to absence or tardiness. **BE ON TIME AND ATTEND EVERY CLASS.** Students will not be dropped for excessive unexplained absences. If you stop attending class and do not drop, you may receive a failing grade. Please refer to the *HCCS Student Handbook* for further information on attendance and dropping courses.

Instructor Grading Criteria

Your final course grade will be calculated in the following manner:
- Three Exams (20%)
- Final Exam (20%)
- Quizzes (20%)
- Homework and class work (20%)
- Research Project (20%)

Rounding rules apply.

Make-Up Assignments and Exams

There are **no make-up assignments or exams**. Students have ample time to complete assignments. If you wait until the last minute and there is a problem that prevents you from completing

an assignment, you will not be allowed additional time. The grade for a missed exam will be dropped only if there is a reason found acceptable by the instructor. If the instructor does not find the reason for missing the exam acceptable, a "zero" will be recorded for that exam. Acceptable reasons to drop an exam grade include, but are not limited to, hospitalization, detention in jail, or a death in the family. Documentation must be provided. Pay attention to due dates and times.

HCC Student Course Grade Appeal Procedure

Any student who takes issue with the course or how it is taught should first express his or her specific concerns to the instructor. Any challenges to the final course grade are governed by the HCC Student Course Grade Appeal Procedure. The following statements are excerpts from the Procedure: (http://www.hccs.edu/hccs/current-students/student-rights-policies-procedures)

- "A student has a right to appeal a grade that the student believes was contrary to procedures as specified in the course syllabus or was based on bias, caprice, or computational or clerical error."
- "Faculty members have a right to have the grades they assign upheld unless it is clearly demonstrated that a grade was contrary to procedures as specified in the course syllabus or was based on bias, caprice, or computational or clerical error."
- "The student has the burden of proof. The student must present clear evidence that a grade was contrary to procedures as specified in the course syllabus or was based on bias, caprice, or computational or clerical error."

Instructional Materials

Gravetter & Wallnau//Essentials of Statistics for the Behavioral Science,8e//Cengage//ISBN 9781133956570

Technical Compliance Notice and How to Handle Technology Problems

This class is a hybrid class using Eagle Online for notes, linked slides, and assignments and assessments. Each student must maintain Internet access throughout this course -- from start to finish. Additionally, students are expected to maintain a state of technical compliance, including (but not limited to): up-to-date software as required by the instructor; a stable Internet connection; and use of the Firefox browser when using Eagle Online. The instructor will not give consideration for lost/missing/unacceptable

work stemming from technical non-compliance and/or end-user technical issues, including loss of computer or battery failure. Any student who cannot keep up with the coursework owing to a lack of computer or Internet access must drop the course. Any student found to have quit logging in (1 week) and whom the instructor is unable to contact is subject to being dropped without further warning, resulting in either a "W" or a "FX" grade, depending upon the time of the term at which the behavior is noted.

HCC Policy Statement:

Access Student Services Policies on their Web site: http://hccs.edu/student-rights

EGLS3 -- Evaluation for Greater Learning Student Survey System

At Houston Community College, professors believe that thoughtful student feedback is necessary to improve teaching and learning. During a designated time near the end of the term, you will be asked to answer a short online survey of research-based questions related to instruction. The anonymous results of the survey will be made available to your professors and department chairs for continual improvement of instruction. Look for the survey as part of the Houston Community College Student System online near the end of the term.