

# Educational Research and Statistics



CEST 6300 Online Course  
New Orleans Baptist Theological Seminary  
Christian Education Division  
Spring 2019

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*The mission of New Orleans Baptist Theological Seminary is to equip leaders to fulfill the Great Commission and the Great Commandments through the local church and its ministries.*

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## **Purpose of the Course**

The purpose of this course is to promote student mastery of basic tools in research design and statistical analysis -- the advanced languages of Christian education. These tools include both a required vocabulary to help students become better consumers of academic research, and the requisite skills for designing an original study, collecting valid data, and analyzing collected data in order to answer real world questions that confront contemporary educational ministries.

Essentially, CEST 6300 is a language course, laying the linguistic and conceptual foundation for analyzing empirical research in doctoral seminars, and eventually writing a research prospectus, conducting original research, and writing a formal dissertation.

## **Core Value Focus**

*Doctrinal Integrity* – Knowing that the Bible is the Word of God, we believe it, teach it, proclaim it, and submit to it. The doctrinal statements used in our evaluations are our Articles of Religious Belief and the Baptist Faith and Message Statement.

*Spiritual Vitality* – We are a worshiping community, with both personal spirituality and gathering together as a Seminary for the praise and adoration of God and instruction in His Word.

*Mission Focus* – We are not here merely to get an education or to give one. We are here to change the world by fulfilling the Great Commission and the Great Commandments through the local church and its ministries.

*Characteristic Excellence* – What we do, we do to the utmost of our abilities and resources as a testimony to the glory of our Lord and Savior Jesus Christ.

*Servant Leadership* – We follow the model of Jesus and exert leadership and influence through the nurture and encouragement of those around us.

Annually, the President designates a core value that will become the focus of pedagogy for the year.

For **2018-2019** academic year that Core Value is *Doctrinal Integrity*.

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### **Curriculum Competencies Addressed**

New Orleans Baptist Theological Seminary curriculum is guided by seven basic competencies: biblical exposition, Christian theological heritage, disciple making, interpersonal skills, servant leadership, spiritual and character formation, and worship leadership.

This course will emphasize the following curriculum competencies:

1. *Disciple Making*: To stimulate church health through mobilizing the church for missions, evangelism, discipleship, and church growth.
2. *Servant leadership*. To serve churches effectively through team ministry.
3. *Spiritual and Character Formation*: To provide moral leadership by modeling and mentoring Christian character and devotion.

### **Course Description**

The course explores (1) the nature of science as a way of knowing, (2) the scientific method as a means of collecting credible empirical data regarding questions raised by educational ministries, and (3) statistical procedures as the means of analyzing collected data.

**The biblical basis for honest measures and analyses is found in passages such as “The Lord abhors dishonest scales, but accurate weights are his delight” (Pr 11:1, NIV. See also Lv 19:36; Dt 25:15; Pr 16:11, 20:23; Mi 6:11).**

Christian ministers can use quantitative methods to improve educational and administrative programs in the local church, taking “captive every thought to make it obedient to Christ” (2 Co 10:5-6, NIV). Through this course, students will construct an educational foundation for doctoral level research and analysis.

### **Student Learning Objectives**

In order to serve local churches and denominational agencies effectively through Christian Education research, the students will demonstrate . . .

1. . . . understanding of the principles of research design, the structure of a formal research proposal, the various types of research, their corresponding approaches to data gathering, and the appropriate statistical procedure for each type by submitting clear and correct assignments and examinations.
2. . . . appreciation for credible data collection and sound statistical analysis by their willingness to give themselves to assignments, discussions, and exam preparation.
3. . . . skill in solving statistical problems by using statistical procedures in an appropriate and competent manner.

### **Required Text**

Yount, William. *Research Design and Statistical Analysis for Christian Ministry*, 5<sup>th</sup> ed. Fort Worth: Self-published, 2015. (Free download from Blackboard: “**Content**”)

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## Course Teaching Methodology

### Units of Study

The topics of study (corresponding to chapters in text) that will be covered in the course are as follows:

#### Unit 1: Research Fundamentals

1. Science and Faith
2. The Research Proposal
3. Measurement Types: Nominal, Ordinal, Interval, Ratio
4. Problem and Hypothesis
5. Introduction to Statistical Analysis: A Meta-Flowchart
6. Synthesis of Related Literature
7. Sampling and Populations
8. Measurement Triad: Objectivity, Validity, Reliability

#### Unit 2: Research Methods

9. Observation Research
10. Survey Research: Interviews and Questionnaires
11. Testing
12. Attitude Scales
13. Experimental Designs

#### Unit 3: Statistical Fundamentals

14. Math Review
15. Graphing Data
16. Focus and Scatter: Central Tendency and Variation
17. The Normal Curve
18. Error Rates and Statistical Power

#### Unit 4: Statistical Procedures

19. One-sample Tests of Difference (z-, t-)
20. Two-Sample Tests of Difference (independent t, matched t)
21. One-Way Analysis of Variance (F); Multiple Comparisons (LSD, FLSD, HSD)
22. Correlation (Pearson r, Spearman rho, Kendall tau)
23. Chi-Square (Goodness of Fit, Test of Independence)

#### Unit 5: Introduction to Advanced Procedures

24. Ordinal Differences (Wilcoxin T, Mann-Whitney U, Kruskal-Wallis H)
25. n-Way ANOVA, ANCOVA, MANOVA (extra credit)
26. Linear and Multiple Regression (extra credit)

### Teaching Method

This course will emphasize a format of teaching and learning that leads to skill-based mastery of vocabulary, concepts, and procedures. This includes weekly reading assignments, writing assignments, lecture, demonstrations, problem-solving assignments, and conceptual examinations.

**Delivery Format**

The course will be delivered on-line through Blackboard. Since this is designed as a full semester course, no pre-course assignments will be made. See the course overview for weekly units.

**Course Policies**

The following policies will serve to govern both the student and professor for the duration of this course.

**Assignment Submission**

Assignments will be made available to student access on Monday morning. Written work is due **Friday night before midnight**. Evaluations of two student submissions are due before **Sunday midnight**. Assignments not posted on time will be docked 50%.

**Assignment Format**

All assignments are to be submitted in Word (preferred), PDF, WordPerfect, or Rich Text formats. They are to be typed, double-spaced with 12-point font (Times New Roman preferred) and 1-inch margins unless otherwise indicated. You may either “cut and paste” the final draft of each assignment into the appropriate Discussion Board under your personally created thread, or attach the document. Since not every student has both Word and WordPerfect word processors, attach whole documents as PDFs or Rich Text files.

Include a Turabian format cover page that includes **name, date of submission and assignment title**. A Turabian style guide is available in the NOBTS library and located on the NOBTS web site at <http://www.nobts.edu/resources/pdf/Extensions.Old/turabiantutor7thjan08.pdf>.

**Netiquette**

Appropriate Online Behavior. Each student is expected to demonstrate appropriate Christian behavior when working online on Discussion Boards or whenever interaction occurs through web, digital, or other electronic medium. The student is expected to interact with other students in a fashion that will promote learning and respect for the opinions of others in the course. A spirit of Christian charity is expected at all times in the online environment.

**Academic Honesty Policy**

All graduate and undergraduate NOBTS students, whether on-campus, internet, or extension center students, are expected to adhere to the highest Christian standard of honesty and integrity when completing academic assignments for all courses in every delivery system format. The Bible provides our standard for academic integrity and honesty. This standard applies whether a student is taking tests, quizzes, exams, writing papers, completing Discussion Boards, or any other course requirement.

**NOBTS Grading Scale Percentages**

A 93-100%    B 85-92%    C 77-84%    D 70-76%    F 0-69%

**Grading Scale by Points, based on 900 points**

A 837-900    B 765-836    C 693-764    D 630-692    F 0-629

## Course Grade Computation

The professor will prescribe a grade based upon the student's satisfactorily completion of the following:

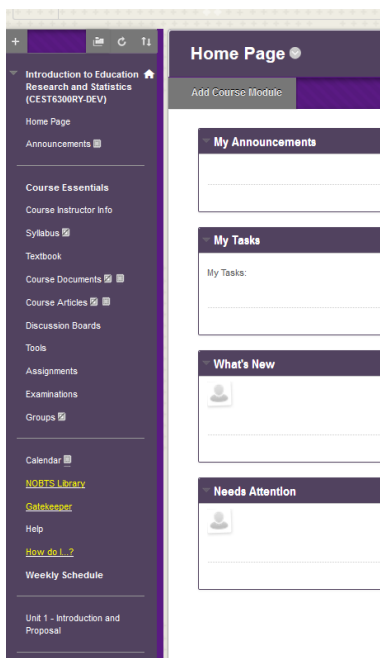
Written Assignments (20x14)	280	Due each Friday by midnight
Written Responses (10x14)	140	Due each Sunday by midnight
Unit Exams (20x14)	280	Due each Sunday by midnight
Intellectus Statistics Assignments (20x10)	<u>200</u>	Due as scheduled
	900	

## Course Schedule Legend

The following course schedule provides a concise overview of the course. Elements in this overview match elements in the Blackboard course itself. The following explanations will help you connect the Schedule with the Blackboard course.

Week ~ The course is divided into 14 weekly units (with an extra credit 15<sup>th</sup>). Blackboard uses the term "Unit" rather than "Week" since the course can be offered in other than "weekly" formats.

Sign into Blackboard CEST 6300 and find a purple column on the left of the screen. Major headings include Course Title, Home Page, Announcements, Course Essentials, and **Weekly Schedule**.



The links under "**Weekly Schedule**" correspond to the numbered weeks in the Syllabus "**Course Schedule**." Click on any Unit link to see the assignments for that unit/week. Use these links to plan ahead.

The **On-line Course Syllabus** (this PDF document) is located under "Syllabus."

The **course textbook** (PDF files) is located under "**Textbook**."

**Reading assignments** in the Syllabus Schedule refer to this text.

**Introductory Videos** are located under "**Course Documents**."

**Supplemental Reading** is located under "**Course Articles**."

The folder "**Discussion Boards**" contain re-stated assignments week by week and **gives access to "Create Thread" where you create your weekly post and respond to the posts of fellow students**. Boards become available each Monday morning for the 15 weeks of the course. "Assigned Questions X" in the Schedule refers to Questions displayed under the BB "Weekly Schedule" link and the "Discussion Board" assignments for Week (Unit) "X."

The folder "**Assignments**" contains the (redundant) **Course Schedule** contained in this syllabus (next).

The folder "**Examinations**" contains the weekly "**Unit Exams**" (Exam 1, 2, 3 . . . )

**Course Schedule**  
(Spring 2018)

WEEK	TOPICS	ASSIGNMENTS
<b>Introduction</b>		
1	<b>Introduction to Research Design and Statistical Analysis</b>  <b>The Research Proposal</b>	View Introductory Video 1 Read <b>chapters 1-2, <i>Research and Statistics for Christian Ministry</i></b> Read "The Bible and Research" Answer Assigned Questions 1 and Post Exam 1
<b>RESEARCH DESIGN: Fundamentals</b>		
2	<b>Empirical Measurement: Data Types Problems and Hypotheses</b>	View Introductory Video 2 Read <b>chapters 3-4</b> Answer "Assigned Questions 2" and Post Exam 2
3	<b>The Statistical Flowchart Synthesis of Related Literature</b>	View Introductory Video 3 Read <b>chapters 5-6</b> Answer "Assigned Questions 3" and Post Exam 3
4	<b>Populations and Sampling The Measurement Triad</b>	View Introductory Video 4 Read <b>chapters 7-8</b> Answer "Assigned Questions 4" and Post Exam 4
<b>RESEARCH DESIGN: Methods</b>		
5	<b>Observation Survey Methods</b>	View Introductory Video 5 Read <b>chapters 9-10</b> Answer "Assigned Questions 5" and Post Exam 5
6	<b>Creating Test Items and Tests Creating Attitude Scales</b>	View Introductory Video 6 Read <b>chapters 11-12</b> Answer "Assigned Questions 6" and Post Exam 6
7	<b>Experimental Designs: Cause and Effect Research Design Review</b>	View Introductory Video 7 Read <b>chapter 13 and Review</b> Answer "Assigned Questions 7" and Post Midterm Exam 7
<b>STATISTICAL ANALYSIS: Fundamentals</b>		

<b>STATISTICAL ANALYSIS: Fundamentals</b>		
8	Introduction to Mathematical Terms Graphing Data	View Introductory Video 8 Read chapters 14-15 Answer "Assigned Questions 8" and Post Exam 8
9	Central Tendency and Variation The Normal Curve Defined	View Introductory Video 9 Read <b>chapters 16-17</b> Answer "Assigned Questions 9" and Post Exam 9
10	The Normal Curve and Error Rates Statistical Fundamentals Review	View Introductory Video 10 Read <b>chapter 18 and Review</b> Answer "Assigned Questions 10" and Post Exam 10
<b>STATISTICAL ANALYSIS: Procedures</b>		
11	One-Sample z- and t-Tests Independent and Matched t-Tests	View Introductory Video 11 Read <b>chapters 19-20</b> Answer "Assigned Questions 11" and Post Exam 11
12	One-Way Analysis of Variance (ANOVA) Multiple Comparison Procedures	View Introductory Video 12 Read <b>chapter 21</b> Answer "Assigned Questions 12" and Post Exam 12
13	Correlation Chi-Square Tests	View Introductory Video 13 Read <b>chapters 22-23</b> Answer "Assigned Questions 13" and Post Exam 13
14	Ordinal Tests of Difference (small n)	View Introductory Video 14 Read <b>chapter 24 and Review</b> Answer "Assigned Questions 14" and post Final Exam Comprehensive Exam 14
15	Factorial ANOVA, ANCOVA, MANOVA Linear and Multiple Regression ( <i>extra credit</i> )	View Introductory Video 15 Read <b>chapters 25-26</b> Answer "Assigned Questions 15" and post Final Exam 15

\*The professor reserves the right to make changes to the schedule as needed.

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## ***Intellectus Statistics***

This course will make use of an on-line statistical package called *Intellectus Statistics* to introduce you to statistical procedures and statistical analysis. While limited in scope compared to SPSS, *IS* is a new generation of statistical software that walks you through the procedural steps of analysis. Best of all, *IS* goes beyond obtuse tables and *writes out a clear interpretation* of statistical findings in APA format. It is like having a built-in statistical consultant.

While you will still need to master statistical concepts and procedures, *IS* eliminates much of the trial-and-fail experiences students often experience under the mountain of SPSS.

You will have ten assignments using *IS* software. You will need to buy a license for the course, which costs (at this writing) \$65 for the entire semester. Thereafter, you can rent *IS* a month at a time for \$60. You can do all your data gathering and organization in *Excel* and upload the file to *IS* when you are ready to analyze it. Or, you can use the built-in editor in *IS* to enter data directly. Then run one or more analyses on this data. *IS* will format a Word document that contains a report of the findings, graphs and charts summarizing findings, and a detailed narrative that explains the outcome for each procedure run.

We will walk you through the steps as we move through the course. Since I am giving you the textbook, and saving you hours of learning the syntax of SPSS commands, I believe you will find the \$65 investment worth every penny.

During the first week of the course, I will send you a link where you can go to purchase your license. We will not need the software until week 3 (Chapters 5-6), but order it as soon as you receive the link.

The website has many tutorials and helpful suggestions, as well as sample data files to practice on if you care to do so. Or, simply wait until we get to the place in the semester where you will need to use the program.

You can investigate Intellectus Statistics at <http://www.intellectusstatistics.com/>

## **Selected Bibliography**

Creswell, John W. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 4<sup>th</sup> ed. Los Angeles: Sage Publications, Inc. 2014

Houser, Rick A. *Counseling and Educational Research: Evaluation and Application*, 3<sup>rd</sup> ed. Los Angeles: Sage Publications, Inc. 2015

Johnson, R. Burke and Larry Christensen. *Educational Research: Quantitative, Qualitative, and Mixed Approaches*, 5<sup>th</sup> ed. Thousand Oaks, California: SAGE Publications, Inc. 2014



Pelham, Brett W. *Intermediate Statistics: A Conceptual Course*. Thousand Oaks, California: SAGE Publications, Inc. 2013

*While these texts could prove helpful, the understanding of the many key concepts, symbols, terms, and procedures found in the course text are most important. The text is designed as an educational text, developed over 32 years of teaching graduate level courses. It will help you become fluent in research design and statistical analysis. RY*