

Nova Southeastern University  
School of Computer and Information Sciences

**Course Syllabus**

**DCTE 700 - Research Methodology - 3 credit hours**  
**DCTE 800 - Project in Research Methodology - 4 credit hours**

**Winter, 2004**  
**January 4th thru June 3, 2004**

**Instructor:**

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Professor  
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Office hours: Monday and Wednesday 9:30 am to 4:00 pm

Dr. Terrell prefers to interact with students via e-mail although telephone calls and prearranged visits to the office are always welcome.

**Class Web Site:**

<http://www.scis.nova.edu/~terrell>

**Course Description:**

An in-depth treatment of the research and evaluation process including design, measurement and statistical analysis is provided. Techniques for planning, designing, and conducting research and evaluation projects and collecting and analyzing data using various statistical techniques are examined. Special emphasis is placed on the selection of appropriate methodologies for a variety of problem-solving situations. Software programs for performing statistical procedures are reviewed.

**Required Textbooks:**

Gay, L.R. & Airasian, P. (2003). *Educational research: Competencies for analysis and application* (7th ed.). Upper Saddle River, NJ: Merrill.

Note: You only need the textbook. You will not need the software and workbook.

School of Computer and Information Sciences. *Dissertation guide* (2000).  
Ft. Lauderdale, FL: Author

Note: This book is available from the SCIS program office or the SCIS web site.

*Publication manual of the American Psychological Association* (5<sup>th</sup> ed.).  
(2001). Washington, DC: Author.

### **Exit Competencies:**

Upon completing this class, students will:

1. Understand and apply the educational research process.
2. Be able to clearly present an appropriate research plan and report investigating a problem in the field of computing technology in education.
3. Demonstrate the ability to formulate a good research question, to include areas of background and significance.
4. Develop a research methodology appropriate to the investigation.
5. Select, apply and analyze the appropriate statistical tool for a given scenario.
6. Demonstrate the ability to synthesize hypothesized outcomes with analyzed statistical data in order to make decisions regarding the rejection or failure to reject stated hypotheses.
7. Design and develop original work or research that addresses the use of computing technologies to improve the educational process.
8. Apply skills at supporting ideas with the literature in the field.
9. Apply principles of effective project development to a real life situation.
10. Comprehend the scope of applied research in computing technology in education.
11. Demonstrate skill at producing a research report that is free of errors and adheres to accepted principles of style.

### **Course Outline and Assignments:**

There are seven assignments listed below, five of which are required for the coursework and two that are required for the project. For your planning purposes, the assignments are presented in chronological order by due date rather than by course and project.

### **PHILOSOPHY OF ASSIGNMENTS:**

It is the professor's belief that all doctoral students should have a grounding in the classic forms of research methodology and statistics. Because of that, class assignments will be limited to research that is historical, descriptive or experimental in nature. Consideration will not be given to developmental or evaluative studies.

Because this is a seven credit hour course, there is a heavy workload. Students are expected to spend at least six hours per week reading, completing the assignments and responding to topics on the class forums.

IMPORTANT NOTE: This is doctoral level work and will be presented at that level. The professor expects that student work will also be presented at that level.

### **Basic Instructions:**

In this course students will be required to complete practice examinations, tasks and case studies.

1. The practice examinations are found at the book's web site: [www.prenhall.com/gay](http://www.prenhall.com/gay). You will be asked for an e-mail address to which you will send the results. You must use [terrell@nova.edu](mailto:terrell@nova.edu).
2. Each of the tasks is found in the textbook. Your answers must be submitted via ESET.
3. Each of the case studies is found on the course web site: [www.scis.nova.edu/~terrell](http://www.scis.nova.edu/~terrell). Your answers must be submitted via ESET.

### **Assignment 1: Selection and Definition of a Research Problem**

Due Date: 2/8/04

Assigned Reading:

Gay and Airasian, Chapters 1 - 2.

Deliverables:

1. Complete and submit the practice quizzes for both chapters.
2. Complete and submit Task 2 in the textbook.

### **Assignment 2: Preparation and Evaluation of a Research Plan**

Due Date: 2/22/04

Assigned Reading:

Gay and Airasian, Chapter 3.

Deliverables:

1. Complete and submit the practice quiz for Chapter 3.
2. Complete and submit Task 3 in the textbook.

### **Assignment 3: Selection of a Sample**

Due Date: 3/14/04

Assigned Reading:

Gay and Airasian, Chapter 4.

Deliverables:

1. Complete and submit the practice quiz for Chapter 4.
2. Complete and submit Task 4 in the textbook.

### **Assignment 4: Selection of Measuring Instruments**

Due Date: 3/28/04

Assigned Reading:

Gay and Airasian, Chapter 5

Deliverables:

1. Complete and submit the practice quiz for Chapter 5.
2. Complete and submit Task 5 in the textbook.

### **Assignment 5: Development of a Design for a Research Study**

Due Date: 4/11/04

Assigned Reading:

Gay and Airasian, Chapters 10 – 13.

Deliverables:

1. Complete the multiple-choice quiz for all chapters.
2. Complete and submit Task 8 in the textbook.

**Assignment 6: Statistical Data Analysis**

| Reading from Terrell Book | Case Study                            | Due Date |
|---------------------------|---------------------------------------|----------|
| Chapters 1-2              | Hypotheses                            | 1/18/04  |
| Chapters 3-4              | Variables                             | 2/1/04   |
| Chapters 5-6              | Descriptive Statistics                | 2/15/04  |
| Chapters 7-9              | Basics of Inferential Decision Making | 3/7/04   |
| Chapter 10                | One-Sample $t$ test                   | 3/21/04  |
| Chapter 11                | Independent sample $t$ test           | 4/4/04   |
| Chapter 12                | Dependent sample $t$ test             | 4/18/04  |
| Chapter 13                | The Analysis of Variance              | 5/2/04   |
| Chapter 14                | The Chi-square tests                  | 5/16/04  |
| Chapter 15                | The Correlational Procedures          | 5/30/04  |

Deliverables:

The student should complete each case study and submit them individually into the ESET on the due date. The content of each case is self-explanatory – please ask any questions via the forums.

**Assignment 7: Final Examination**

Due Date: 6/3/04

References: All materials read up to this point.

Deliverables:

This examination is obviously "open book" and is designed to be a learning activity. More information will be supplied as the date for the exam approaches.

### **Instructional Methods and Tools:**

The instructor uses a combination of tools to approach this class although, generally speaking, the majority of communication is carried out via electronic mail and threaded forums. In essence, during the initial meeting the instructor sets the stage for the assignments to be completed and demonstrates the content of the course homepage to ensure that students feel comfortable in beginning the initial task. Once students have left campus, the instructor will supply notes, via the forums, on a weekly basis. Students are free to ask questions about the notes as well as post other topics. Students should feel free to call or e-mail the instructor at any time. Pre-arranged visits to campus are also welcome.

### **Assignments:**

Information concerning assignments is presented in the section entitled “Course Outline”.

### **Examinations and Quizzes:**

Information concerning examinations and quizzes is presented in the section entitled “Course Outline”.

### **Grading Criteria:**

NOTE: Assignments submitted past the deadline will be returned with a grade of zero.

Each assignment has been designated as either course or project and each assignment has been assigned a certain number of points. This breakdown is shown below:

Course:

Assignment 1: 100 points  
Assignment 2: 100 points  
Assignment 3: 100 points  
Assignment 4: 100 points  
Assignment 5: 100 points

Course Total: 500 points

Project:

Assignment 6: 250 points  
Assignment 7: 250 points

Project Total: 500 points

Grades for both the course and project will be based on the following scale:

94-100% of points for section:      A

|                                      |    |
|--------------------------------------|----|
| 90- 93% of points for section:       | A- |
| 87- 89% of points for section:       | B+ |
| 84- 86% of points for section:       | B  |
| 80- 83% of points for section:       | B- |
| 77- 79% of points for section:       | C+ |
| 74- 76% of points for section:       | C  |
| 70- 73% of points for section:       | C- |
| Less than 70% of points for section: | F  |

### **Course Rules:**

#### The Grade of *Incomplete (I)*

The grade of Incomplete (I) will be granted only in cases of extreme hardship. In such cases, a student requiring an incomplete must submit a written appeal with full rationale to the instructor at least two weeks prior to the end of the term. The student does not have a right to an incomplete, which may be granted only when there is clear evidence of just cause. Should the instructor agree, an *incomplete contract* would be prepared by the student and signed by both student and instructor. The *incomplete contract* must contain a description of the work to be completed and a completion date. The completion period should be the shortest time possible. In no case may the completion date extend beyond 30 days from the last day of the term for master's courses or beyond 60 days from the last day of the term for doctoral courses. The *incomplete contract* will accompany the formal submission of the instructor's final grade roster to the student's program office. The program office will monitor each *incomplete contract*. If a change-of-grade form is not submitted by the scheduled completion date, the grade will be changed automatically from I to F. No student may graduate with an I on his or her record. The grade of I does not apply to master's thesis or doctoral dissertation registrations.

#### Student Original Work (See also Code of Student Conduct and Academic Responsibility.)

Each student is responsible for maintaining academic integrity and intellectual honesty in his or her academic work. It is the policy of the school that each student be academically honest, which means that each student must:

- Submit his or her own work, not that of another person
- Not falsify data
- Not engage in cheating (giving or receiving help during examinations, acquiring and/or transmitting test questions prior to an in-class examination, or falsifying any records, including admissions material)
- Not receive or give aid on assigned work that requires independent effort
- Properly credit the words or ideas of others according to accepted standards for professional publications (See, for example, *The Publication Manual of the American Psychological Association*.)

- Not use term paper writing services or consult such services for the purpose of obtaining assistance in the preparation of materials to be submitted in courses
- Not engage in plagiarism

### Writing Skills

This is doctoral level work - each student must demonstrate proficiency in the use of the English language in all work submitted for this course. Papers with grammatical and spelling errors will be returned with a grade of zero. The professor will not provide remedial help concerning writing problems that you might have. Students who are unable to write correctly and clearly are urged to seek remedial help from outside sources.

### **Bibliography:**

<http://www.scis.nova.edu/~terrell/biblio.html>