Quantitative data analyses require the use of statistics (descriptive and inferential) to summarize data collected, to make comparisons of data sets, and to generalize results obtained from samples back to the populations from which the sample were drawn. Knowledge about statistics and statistical analysis can help a researcher interpret data for the purpose of providing meaningful insights about the problem being investigated. Prerequisite: DPLS 720.

**Prerequisites:** DPLS 720 Principles of Research
**Professor:** Chris Francovich, EdD
**Office:** 502 E Boone Ave, Tilford Bldg, Room: 227
**Office hours:** Please email or call for an appointment
**Office phone:** (509) 313-3592
**Email:** francovich@gonzaga.edu
**Meeting place:** HR Training Room
**Meeting time:** Saturdays 8-12 am
**Meeting Dates:** (2010): 1/16, 1/30, 2/6, 2/20, 3/6, 3/20, 3/27, 4/10

**Overview**
This course will explore the landscape of statistics, statistical thinking, and the analysis of phenomena using statistical method(s). We will begin the course with a theoretical, conceptual, and discursive look at post-positivist epistemology and quantitative methodology. We will contrast this view with both substance (objectively real) and process (dynamically emergent) ontologies. This beginning part of the conversation will also contrast quantitative methodology with qualitative methodology and thoroughly explore the 'scientific method' and the development and use of research hypotheses.

Following this introduction we will begin a two track strategy that will continue through the remainder of the course. On one track we will gather and interpret numerous empirical research studies using a quantitative methodology and a variety of statistical methods.

These methods will then be looked at more closely on the second track which will investigate both the theory and the practice of various statistical methods. The second track will require of all students experience with basic statistics. Resources to support the gaining of that experience during this course will be available on Blackboard. Class time and instructor led conversation will focus on the meaning and understanding of key concepts with the expectation that students will work on practice sets and reading on their own. Specific practice or application of those concepts (methods) will be carried out in group and individual projects.

The focus on this course is on understanding. The key ideas to be thoroughly understood are:
- Methodological commitments & epistemological assumptions
- Counting
- Grouping
- Sameness
The mathematical and logical foundations of these concepts will be explored in a concrete and elementary way. It is hoped that this basic understanding will support the ability of students to actually make the seemingly complex and difficult world of statistics coherent.

The purposes of this course are to prepare doctoral students and candidates for the task of both creating and consuming good solid research based on a quantitative methodology.

The goals & objectives of this course are to:
- Understand and apply appropriate conceptual frames to positivist, post-positivist, and mixed methods research discourse.
- Relate, understand, and apply post-positivist methodology to research questions relevant to leadership studies.
- Demonstrate a solid understanding of basic statistics through both talking and writing about core statistical concepts.
- Formulate research questions and corresponding statistical hypotheses that can enhance understanding of a given phenomena.
- Create or use existing databases to seek answers to research questions or to test hypotheses.
- Select appropriate statistical techniques (methods) for a given question or hypothesis statement.
- Apply statistical procedures to test hypotheses using appropriate statistical application(s).
- Correctly interpret statistical application output.
- Communicate findings verbally and in written format.

**Grading**

The grading emphasizes on your individual learning achievement in this course. You will largely determine your grade in this course. What is 'great' and what is 'adequate' you can negotiate with the instructor.

Great Effort and great understanding = A
Great Effort and adequate understanding = A-
Adequate effort and adequate understanding = B

**Assignments & Tasks**
- There will be 4 statistics modules on Blackboard created by Dr. Sandi Wilson and used in this course for a number of years. Those modules will be a resource for students and the assigned workgroups. Each module will have associated 'Application Questions' which will be completed by each workgroup. Satisfactory completion of each set of application questions is a basic expectation. See Blackboard for more detail on these assignments.
- Course Projects: A will consist of one group presentation and two individual presentations of a peer reviewed journal article reporting on research using a quantitative methodology.
and increasingly complex methods. See Blackboard for specifics Assignments > Course Projects

• Course Projects - B will involve each individual to imagine, design, test, and write up a mock study using real data to complete a quantitative research project. See Blackboard for specifics Assignments > Course Projects

• Readings and reflective journal - In this course we will use three text based sources - see below, with suggested readings outlined in the course plan below. It is expected that all students will complete all the reading assignments prior to each class meeting. These readings will form the basis for class discussions and exploration of the concepts. These readings will also support and shed light on the 4 modules prepared by Dr. Wilson. The Sirkin text is meant to be both a resource and a primary source of clarification for basic statistical concepts. Selected concepts will be more thoroughly deconstructed in class (e.g., standard deviation, error, variables, probability, p values, t-tests, etc.) Journal entries will be made on Blackboard in the discussion area - see Blackboard > Assignments for specifics on this expectation.

First Meeting
• Housekeeping Issues & Group process
• Foundations of the Course
• Group Work
• Debrief
• Readings 2nd Meeting:
  o Somekh & Lewin pp. 197 - 214
  o Sirkin pp. 1 - 31
  o Keller pp. ix - 47

Second Meeting
• Readings review and discussion - Formalizing assumptions and using the Scientific Method - Distributions & Frequencies
• Group & Individual Presentations
• Discussion & Group Work
• Readings for 3rd Meeting:
  o Somekh & Lewin pp. 215 - 225
  o Keller pp. 48 - 103
  o Sirkin - Chapter 2 - 4
  o Wilson Module 1 - Blackboard

Third Meeting
• Readings review and discussion - counting, measurement, variables, and central tendency, standard deviation, and error
• Group & Individual Presentations
• Readings for 4th Meeting:
  o Somekh & Lewin pp. 226 - 235
  o Sirkin - Chapters 5 - 6
  o Wilson Modules 2 & 3
  o Keller pp. 104 - 151
Fourth Meeting
- Readings review and discussion - Dispersion & Contingency Tables
- Group & Individual Presentations
- Readings for 5th meeting:
  - Somekh & Lewin pp. 236 - 249
  - Sirkin - Chapters 7 - 9
  - Wilson Modules 2 & 3

Fifth Meeting
- Readings review and discussion - Inference, Probability, Z tests and t tests.
- Group & Individual Presentations
- Readings for 6th Meeting:
  - Somekh & Lewin pp. 251 - 273
  - Sirkin - Chapters 10-12
  - Wilson Module 4

Sixth Meeting
- Somekh & Lewin pp. 274 - 281
- Readings review and discussion - ANOVA - Variation revisited
- Group & Individual Presentations
- Readings for 7th Meeting:
  - Sirkin - Chapters 13 - 14

Seventh Meeting
- Readings review and discussion - Regression
- Readings for Final Meeting:

Final Meeting
- Complexity, Multivariate Analysis, Language & Network Theory - Whither research in Leadership Studies?
- Presentations
- Wrap up - Research projects due April 19th

Required Readings

Other readings and web resources will be required and posted on Blackboard or handed out in class