

**COURSE:** ID 302: Understanding Research Principles and the Scientific Method

**COURSE DESCRIPTION:** Introduces research methodologies applicable to health care and the health professions. Emphasizes research methodologies (from qualitative and descriptive to quasi- experimental and experimental), the application of research approaches to health professions-based research questions, and the analysis of reported research. Prepares and requires students to conduct literature searches relevant to the development of researchable questions and appropriate research designs as well as become critical consumers. *Prerequisite: Math 301*

**RECOMMENDED TEXT:** Leslie Gross Portney and Mary P. Watkins, Foundations of Clinical Research - Applications to Practice, 2000. Prentice Hall. ISBN: 0-8385-2695-0

**FORMAT:** Exam consists of 100 multiple choice questions. Each is worth one point.

**GRADING:** Students must receive a “C” (73-76) in order to receive credit for a course taken as a Challenge Exam.

**TOPICS FOR STUDY:**

Sources of Knowledge

Tradition

Authority

Trial and Error

Logical Reasoning

The Scientific Method The Research Process - steps

Types of Research

Basic vs. Applied research

Experimental and nonexperimental research

Purpose of theories in research

Components of theories

Concepts

Constructs

Propositions

Models

Types of theories

Characteristics of theories

Theories and Laws

Evaluating Research Reports - analyzing content of an article

Literature sources Primary source

Secondary source

The research question

Naturalistic (qualitative) Research

Methods

Issues of trustworthiness

Types of studies Experimental Design

Control of experiments - experimental vs. quasi-experimental vs. non-experimental

Design strategies for controlling intersubject differences

Types of experimental validity, threats to validity  
Types of experimental designs - one group, two group, control group, pre-test, post-test, blocked designs, counterbalanced designs, etc. Ethics of Research  
Integrity of researcher - scientific misconduct, scientific fraud  
Protections of Human Subjects  
Institutional Review Board  
Elements of informed consent  
Sampling methods  
Populations and samples  
Sampling error  
Sampling techniques  
Probability sampling  
Simple random sampling  
Systematic sampling  
Stratified random sampling  
Disproportional sampling  
Cluster sampling Non-probability sampling  
Convenience sampling  
Quota sampling  
Purposive sampling  
Snowball sampling  
Statistical inference, hypothesis testing  
Probability  
Confidence intervals  
Errors in hypothesis testing Type 1, type 2  
Survey design and critique  
Types of survey questions, open vs. closed ended Scales  
Likert  
Guttman  
Semantic differential  
Analog  
Validity, reliability of survey instruments  
Reliability of measurements  
Validity of measurements  
Data analysis  
Measures of central tendency Descriptive research t-test, ANOVA parametric vs. nonparametric analysis