

**UNIVERSITY OF PUERTO RICO
MEDICAL SCIENCES CAMPUS
SCHOOL OF DENTISTRY**

Ecological Sciences Department

Course Title	:	Evaluation of Scientific Literature and Epidemiology
Codification	:	DESP 7237
Contact Hours	:	20 hours
Pre-requisites	:	N/A
Co-requisites	:	N/A

Information Regarding the Origin of the Course:

Kathleen E. Crespo Kebler M.S. Ed.D.
Professor

DESCRIPTION

The purpose of this course for the dental students is to develop the basic skills necessary to interpret scientific literature. The course topics are presented through three general components: Research Design, Biostatistics, and Epidemiology. Instructional methodologies used are lectures, exercises and group discussions.

COMPETENCY

Value the role of life long learning, self-assessment, and critical thinking as an integral part of professional behavior.

OUTCOME

Evaluate published clinical and basic science research and apply this information for the improvement of the patient's oral health.

TERMINAL OBJECTIVES:

Upon completion of the course the student will:

1. Discuss the basic components of scientific research.

2. Analyze research designs of articles published in scientific literature.
3. Discuss basic concepts of Biostatistics.
4. Interpret statistical findings in scientific literature.
5. Discuss general concepts in epidemiology.
6. Understand the application of research to clinical decision making.

CONTENT OUTLINE

Topic	Time
I. Introduction to Evidence Based Dentistry	(.5 hr.)
A. Definition of evidence based dentistry	
B. Relevance for clinical practice	
C. Review and analysis of literature	
II. Fundamental Concepts in Research	
A. Variables	(.5 hr.)
1. Units and scales of measurement	
a) measurement error	
2. Types of variables	
a) dependent	
b) independent	
B. Identification of study population	(.5 hr.)
1. Sample	
2. Study subjects	
3. Sampling error	
4. Ethical aspects	

C. External and Internal Validity (1 hr.)

1. Definitions
2. Reliability and precision
3. Threats to validity
4. Bias and confounding

D. Research Designs (4 hrs.)

1. Descriptive
2. Analytical
 - a) observational
 1. case- control
 2. longitudinal
 3. Cross-sectional
 - b) experimental

III. DATA ANALYSIS

A. Descriptive (1 hr.)

B. Statistical Inference (6 hrs.)

1. Probability theory
2. Normal distribution
3. Sampling distribution
4. Estimation
5. Hypothesis testing
6. Significance levels

7. Selection of appropriate statistics

IV. Clinical Epidemiology

- A. Fundamental Concepts (1 hr.)
 - 1. Definition and scope in dentistry
 - 2. Etiologic factors of disease
 - a) host
 - b) agent
 - c) environment
- B. Morbidity and Mortality (1 hr.)
 - 1. Rates
 - 2. Incidence and prevalence
 - 3. Epidemiological indicators in dentistry
- C. Assessment of Risk (1.25 hrs.)
 - 1. Relative risk
 - 2. Odds ratio
 - 3. Importance of assessing risk to improve predictability of outcomes
- D. Validity of Screening and Diagnostic Tests (1.25 hrs.)
 - 1. Sensitivity
 - 2. Specificity

V. Clinical Decisions Based on Research

- A. Evaluation of research articles (1 hr.)
- B. Hierarchy of quality of evidence (1 hr.)

INSTRUCTIONAL STRATEGIES

This course meets weekly in two hour sessions. Instructional strategies include: lectures, exercises and group discussions.

RESOURCES

- A. **Text Book:** Burt, A. & Eklund, S. (1999). Dentistry, Dental Practice, and the Community, 5th Edition. Philadelphia, Pennsylvania: W.B. Saunders Company.
- B. Supplementary readings distributed by the professor.
- C. Transparencies and computer presentations
- D. Library
- E. Statistical analysis computer programs available at the Research Center.

EVALUATION

A. Evaluation criteria consist of exams, exercises and reports as detailed below. A student must obtain at least 70% to approve the course. Grades will be awarded on a scale of A to C.

B. Relative weight of evaluations

Exam I	.25
Exam II	.25
Written Report	.25
Exercises and short tests	.25

C. The following scale will be used for grading:

100 - 90	=	A
89 - 80	=	B
79 - 70	=	C
69 or lower	=	F

BIBLIOGRAPHY

Bulman, J.S. & Osborn, J.F. (2000). Statistics in Dentistry. Great Britain: British Dental Association.

Christensen, Larry B.(2003). Experimental Methodology. Boston. MA.: Alyn and

Bacon,

Creswell, J. (2002). Research Design: Qualitative and Quantitative Approaches. California: Sage Publication, Inc.

Dawson- Saunders, B. & Trapp, R.G. (2004). Basic & Clinical Biostatistics. New York: Lange Medical Books/ McGraw Hill.

Friedland, D. (1999), Go, A.S., Davoren, J.B., Shlipak, M.G., Bent, S.W., Subak, L.L. & Mendelson, T. (1998). Evidence-Based Medicine: A Framework for Clinical Practice. Stamford, Connecticut: Appleton & Lange.

Glantz, S. (2002). Primer of Biostatistics. 5/E CD-ROM & Book Pkg. New York: McGraw- Hill.

Gordis, L. (2000). Epidemiology. Philadelphia: W.B. Saunders Company.

Grady, K. E.& Strudler Wallston B. (2001). Research in Health Care Settings. Newbury, California: SAGE Publications,

Hulley, S. B.& Cummings S. R. (2000). Designing Clinical Research: An Epidemiologic Approach. Baltimore, Maryland: Williams and Wilkins.

Jekel, J., Elmore J.& Katz, D. (2001). Epidemiology Biostatistics and Preventive Medicine. Philadelphia: W.B. Saunders Company.

Kelsey, J.L., Whittemore, A., Evans, A. & Thompson, W.D. (1996). Methods in Observational Epidemiology. New York: Oxford University Press.

Neutens, J. J.& Rubinson, L. (2001). Research Techniques for the Health Sciences. Boston: Allyn and Bacon,

Norman, G. R. & Streiner, D. L. (2000). Biostatistics: The Bare Essentials. St. Louis, Missouri: Mosby.

Norman G.& Streiner D.(2003). Statistics PDQ. Philadelphia: BC Decker.

Rosner, B. Fundamentals of Biostatistics (2000). California: Duxbury Press.

Morganstein G. & Warren M. (2003). Jong's Community Dental Health, 5th Edition. St. Louis, Missouri: Mosby.

Syllabus

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Burt, A. & Eklund, S. (1999). Dentistry Dental Practice and the Community, 5th Edition. Philadelphia, Pennsylvania: W.B. Saunders Company.

Carr, A. & McGivney, G. (2000). User's Guides to the Dental Literature: How to Get Started. The Journal of Prosthetic Dentistry, 83 (1), 13-20.

Jacob, R. & Carr, A. (2000). Hierarchy of Research Design used to Categorize the "Strength of Evidence" in Answering Clinical Dental Questions. The Journal of Prosthetic Dentistry, 83 (2), 137-152.

Carr, A. & McGivney, G. (2000). Measurement in Dentistry. The Journal of Prosthetic Dentistry, 83 (3), 266-271.

Eckert, S., Goldstein, G. & Koka, S. (2000). How to Evaluate a Diagnostic Test. The Journal of Prosthetic Dentistry, 83 (4), 386-391.

Students with any impairment that are receiving Vocational Rehabilitation Services and wish to notify it voluntarily, may communicate with his/her professor at the beginning of the course to plan his/her reasonable accommodation in accordance to the recommendations of the Vocational Rehabilitation Administration. Also, students with special needs that require some type of assistance or reasonable accommodation may communicate voluntarily with the professor.