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C & GE Approved: May 19, 2022
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Semester effective:

Upper Division General Education (UDGE) 3005 Research Methodology and Composition (4 Units)

Prerequisites: Admission to the Dental Hygiene Completion Program and college level statistics course. STAT 1510 or PSYC 2200 or equivalent with a grade of “C” or better.

Hours and Unit Calculations:

64 hours lecture. 128 Outside of class hours. (192 Total Student Learning Hours) 4 Units

Catalog Description: This course is designed to introduce students to the research process and how it applies to evidence-based patient care. Emphasis on research design and methods, scientific databases, and evidence-based resources. Application of research methods and statistical techniques to the critical evaluation of current scientific literature.

Type of Class/Course: Degree Credit

Textbooks:

Forrest, Jane L., et al. *Evidence-Based Decision Making: A Translational Guide for Dental Professionals*, 9th ed. Lippincott, Williams & Wilkins, 2012.

Patten, Mildred L., and Michelle Newhart. *Understanding Research Methods: An Overview of the Essentials*, 10th ed., Routledge, 2017.

Chiappelli, Francesco & Brant, Xenia & Oluwadara, Oluwadayo & Neagos, Negoita & Ramchandani, Manisha. 2005.

Introduction: Research Synthesis in Evidence-Based Clinical Decision-Making. Evidence-Based Practice: Toward Optimizing Clinical Outcomes. 3-16. 10.1007/978-3-642-05025-1 1.

Additional Required Materials: Dental Hygiene Journal

Course Objectives:

By the end of the course, a successful student will be able to:

- 1. Compile a list of scientific articles for a literature review/research paper.**
- 2. Critically analyze scientific journal articles.**
- 3. Differentiate between components of research design.**
- 4. Apply the principles of scientific writing.**

Course Scope and Content:**Unit I** **Literature Review**

- A. **Purpose of the literature review**
- B. **Development of a literature review**
 - a. **identifying the problem**
 - b. **searching databases**
 - i. **sources for literature review**
 - 1. **scientific peer-reviewed journals**
 - 2. **conference proceedings**
 - 3. **government reports**
 - ii. **citing references**
 - iii. **evaluating sources**
 - 1. **scientific peer-reviewed journals**
 - 2. **conference proceedings**
 - 3. **government reports**
- C. **Evaluating data**
 - a. **summarizing information**
 - b. **determine importance of information to topic**
- D. **Analyzing and drawing conclusions**
 - a. **finding similarities and differences between articles**

Unit II **Critical analysis**

- A. **Parts of a scientific journal article**
 - a. **abstract**
 - b. **introduction**
 - c. **methods and materials**
 - d. **results**
 - e. **discussion**
 - f. **conclusion**
 - g. **references**
- B. **Purpose of critical analysis**
 - a. **evaluate strengths and weaknesses**
 - b. **determine if research is valid**
- C. **Criteria**
 - a. **type of publications**
 - i. **textbooks**
 - ii. **peer-reviewed journals**
 - iii. **current vs historical resources**
 - b. **authors' qualifications**
 - c. **purpose of research**
 - d. **methods and materials**
 - i. **validity and reliability**
 - ii. **sampling methods**
 - iii. **statistical analysis**
 - iv. **research design**
 - e. **results**
 - f. **discussion**
 - i. **conclusions supported by findings**

- ii. recommendations for future research
- g. references
 - i. comprehensive list
 - ii. combination of historical and current sources

Unit III Research Design

- A. Study design
 - a. prospective cohort
 - b. retrospective case control
 - c. cross-sectional
 - d. clinical trials
 - i. double blind and single blind studies
 - ii. parallel design
 - iii. crossover design
- B. Sampling methods
 - a. convenience
 - b. judgmental
 - c. stratified
 - d. randomized
 - e. systematic
- C. Controlling bias
 - a. sample size
 - b. examiner calibration
 - i. intrarater reliability
 - ii. interrater reliability
 - c. validity
 - d. sampling method
- D. Hypothesis testing
 - a. alternate hypothesis
 - b. null hypothesis
 - c. Type 1 error
 - d. Type 2 error
 - e. variables
 - i. independent
 - ii. dependent
 - iii. confounding
- E. Research ethics
 - a. informed consent
 - b. Institutional Review Board

Unit IV Scientific writing

- A. Organization of information
 - a. Outlines
 - b. paragraph order
 - i. topic sentences
 - ii. supporting information
- B. Style
 - a. Scientific terminology
 - b. use of abbreviations

- c. sentence structure
 - i. past or present tense
 - ii. first or third person
 - iii. basic grammar guidelines
- C. Bibliography
 - a. NLM format (National Library of Medicine)
 - b. how to cite references within paper
- D. Reference sources
 - a. Library catalog
 - b. CREDO Reference
 - i. Books
 - c. Library catalog
 - d. eBook Academic Collection (EBSCOhost)
 - i. Periodicals (journals, magazines, and newspapers)
 - e. Electronic databases, including PubMed, MEDLINE, and Dentistry & Oral Sciences Source
 - f. Internet sources (.gov, .edu, .org, .com, etc)
 - i. Search engines

Learning Activities Required Outside of Class

The students in the class will spend a minimum of 8 hours per week outside of the regular class time doing the following:

1. **Read a 10-page scientific journal article on a contemporary topic in health care and identify the purpose of the study, hypothesis and independent and dependent variables.**
2. **Conduct a literature search on a health related topic and compile a list of 10-15 articles from current, peer-reviewed journals.**
3. **Write a review of the literature using 10-15 articles from current, peer-reviewed journals.**

Methods of Instruction

1. **Lecture presentation, online discussions and case study analysis**
2. **Presentations of major projects followed by discussion and evaluation.**

Methods of Evaluation

1. **Written Critical Evaluation of a current scientific research.**
2. **Literature Search based on research problem.**
3. **Exams (multiple choice, short answer, essay questions).**
4. **Problem solving exercises.**
5. **Oral presentation on research.**
6. **Small group work**

Supplemental Data:

<u>TOP Code:</u>	<u>499900: Other Interdisciplinary Studies</u>
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<u>SAM Priority Code:</u>	<u>E: Non-Occupational</u>
<u>Distance Education:</u>	<u>Not Applicable</u>
<u>Funding Agency:</u>	<u>Y: Not Applicable(funds not used)</u>
<u>Program Status:</u>	<u>1: Program Applicable</u>
<u>Noncredit Category:</u>	<u>Y: Not Applicable, Credit Course</u>
<u>Special Class Status:</u>	<u>N: Course is not a special class</u>
<u>Basic Skills Status:</u>	<u>N: Course is not a basic skills course</u>
<u>Prior to College Level:</u>	<u>Y: Not applicable</u>
<u>Cooperative Work Experience:</u>	<u>N: Is not part of a cooperative work experience education program</u>
<u>Eligible for Credit by Exam:</u>	<u>NO</u>
<u>Eligible for Pass/No Pass:</u>	<u>NO</u>
<u>Taft College General Education:</u>	<u>Meets General Education requirement for Bachelors Degree</u>
<u>Discipline:</u>	<u>Dental Technology or Interdisciplinary Studies or Psychology or Sociology or Health</u>