2.12 COURSE OUTLINE

2.12.1 HSC 3492: RESEARCH METHODS & BIOSTATISTICS

Credit Units: 3

2.12.2 Purpose of the course;

This course provides the students with a comprehensive introduction to research, including its theoretical foundation and fundamental protocols. It enrolls students majoring in the social sciences, humanities, natural and physical sciences, and professional fields.

2.12.3 Expected Learning Outcomes of the Course;

At the end of the course, the student should be able to:

- Describe common experimental and non-experimental research designs in pharmacy research and discuss their strengths and weaknesses
- Identify the appropriate statistical test(s) to analyze a given set of data that employ common research designs, and interpret results
- Define bias and confounding, describe common methods to control for confounding/reduce bias and interpret results
- Define validity and reliability, explain how they are measured and interpret results
- Calculate common descriptive (e.g., rates), validity (e.g., sensitivity) and effect (e.g., relative risk, number needed to treat) measures and interpret results
- State research problems clearly and precisely and identify each step in the research process including awareness and appreciation of ethical issues in research
- Identify a research problem, nominate an appropriate research method to address the problem and apply that research method
- Develop a set of hypotheses to be tested
- Apply computer technology in the solution of research problems
- Design an appropriate questionnaire

2.12.4 Course Content;

Research methodologies: applied research, and research writing. Overview of the Research Process. Literature Review. **Conceptual Framework & Research Designs.** Research Proposals. **Library Research & References Guide**. Survey Development, Implementation, & Data Management; Introduction to Qualtrics Survey Software; Literature Review Section; Quantitative Analysis & Statistical Procedures. Introduction to use of **Statistical Product and Service Solutions (SPSS)**: Qualitative Analysis, Data Collection Procedures, & Mixed Method Approaches; Analytic Techniques.**The Research Proposal.** Power Point Presentation. **Questionnaire design** and **sampling issues**. **Descriptive statistics**.Samples, populations and their distributions.Comparing means.Validity, Reliability, Bias, Confounding, effect.**Chi-square and contingency table analysis**.**Linear regression**.**Correlation and coefficient of determination**.

2.12.5 Mode of Delivery;

Lectures, power point presentations, and class discussions. These will take a participatory approach. The students will be given exercises in proposal writing and statistical calculations.**Video demonstrations and/or CD-Roms** on Proposal presentations and defensewhen available.**Assignment**

criteria: Students will be given several individual or group research assignments on topics relevant to the course. These could include lectures, discovery learning, problem-based learning, experimental learning, group-based learning, independent studies and e-learning.

2.12.6 Instructional Materials and/or Equipment;

Lecture notes or power points for presentation; Video demonstrations; CD-Roms; Text books; National Commission for Science, Technology and Innovation Ethical Guidelines for research; Sample Research Proposals; Referencing Guidelines.

2.12.7 Course Assessment;

2.12.7.1 Distribution of Marks

Attendance & Participation	10%
Continuous Assessment Tests /Quizzes	10%
Term Paper	25%
Mid-Quarter Exam	25%
Final Exam	30%
Total	**100%**

2.12.7.2 Grading

90 - 100	A
87 - 89	A^-
84 - 86	B^+
80 - 83	B
77 - 79	B^-
74 - 76	C^+
70 - 73	C
67 - 69	C^-
64 - 66	D+
62 - 63	D
60 - 61	D-
00 - 59	F

2.12.8 Core Reading Materials for the Course;

Aparasu R. (2010). Research Methods for Pharmaceutical Practice and Policy. 1st Edition. Pharmaceutical Press, London

KNH/UON ERC. (2013). KENYATTA NATIONAL HOSPITAL/U.O.N/ ETHICS & RESEARCH COMMITTEE GUIDELINES FOR PROTOCOL DEVELOPMENT.Version 1.

Nwabueze RN. (2013). Legal and Ethical Regulation of Research Involving Human Research in Developing Countries. Ashgate Publishing Limited, St John Street, London

Oliveira AM, Oliveira A. (2013). Biostatistics Decoded. Wiley & Sons Limited, Hoboken, NJ, USA

2.12.9 Recommended Reference Materials;

Brink H. (2012). Fundamentals of Research Methodology for Healthcare Professionals. 3rd Edition. Juta & Company Limited, Claremont, RSA

Curtis. (2013). Quantitative Health Research Methods: From Theory to Practice. McGraw-Hill Education, New York, USA

Green J. (2013). Qualitative Methods for Health Research. 3rd Edition. SAGE Publications Limited, Thousand Oaks, CA

Krska J. Ed. (2010). Pharmacy in Public Health. 1st Edition. Pharmaceutical Press, London

Omonzejele PF. (2012). The Ethics of Medical Research in Africa. Lambert Academic Publishing, Saarbrücken, Germany

Smith FJ. (2010). Conducting Your Pharmacy Practice Research Project: A step-by-step guide. 2nd Edition. Pharmaceutical Press, London