MORAVIAN COLLEGE

Comenius Center

COURSE NO: **CCBU 502 GA/NURS 502 GH**

COURSE TITLE: Epidemiology and Bioinformatics

CREDIT HOURS: Three

SEMESTER: Fall of 2015

CONTACT HOURS: Three hours weekly

INSTRUCTOR: Helen Kohler, PhD, RN
Visiting Professor, Moravian College
Visiting Professor, University of Eastern Africa in Kenya
Email: hrkohler1@aol.com Phone: 610-336-8488

REQUIRED TEXT:

Katz, D.L., Elmore, J.G., Wild, D.M.G., & Lucan, S.C. (2014). *Jekel's epidemiology, biostatistics, preventive medicine, and public health* (4th ed.). Philadelphia: Saunders.

ADDITIONAL TEXTS AND REFERENCES:

Amatayakul, Margret. (2015). How technology is transforming health care careers. *Advance for healthcare careers: Annual resource guide, 2015.*

American Nurses Association. (2008). *Nursing informatics: Scope and standards of practice.* Silver Spring, MD: ANA.

Beltz, L.A. (2011). *Emerging infectious diseases.* Washington, DC: American Public Health Association.

Berkman, L.F., Kawachi, I., & Glymour, M.M. (2014). *Social epidemiology* (2nd ed.). New York: Oxford.

Crichton, M. (1969). *The Andromeda strain.* New York: Alfred A. Knoff.

Crisp, N. (2010), *Turning the world upside down: The search for global health in the 21st century.* London: Royal Society of Medicine Press.

Dobson, M. (2013). *Disease: The extraordinary stories behind history's deadliest killers.* New York: Sterling Publishing.

Fos, P.J., & Fine, D.J. (2012). *Managerial epidemiology for health care organizations* (2nd ed.). San Francisco: Jossey-Bass.

Friis, R. H., & Sellers, T.A. (2014). *Epidemiology for public health practice* (5th ed.). Burlington, MA: Jones & Bartlett Learning.

Giguere, N. (2008). Informatics is revolutionizing health care. *Minnesota Nursing, Spring/Summer 2008*, 9-13.

Gordis, L. (2009). *Epidemiology* (4th ed.). Philadelphia: Elsevier/ Saunders.

Hebda, T., & Czar, P. (2012). *Handbook of informatics for nurses and health care professionals* (5th ed.). Tappan, NJ: Prentice Hall

Hebel, J.R., & McCarter, R.J. (2012). *A study guide to epidemiology and biostatistics* (7th ed.). Burlington, MA: Jones & Bartlett Learning.

Heymann, D. L. (Ed.). (2014). *Control of communicable diseases manual* (20th ed.). Washington, DC: American Public Health Association.

Macha, K., & McDonough, J.P. (2012). *Epidemiology for advanced nursing practice.* Sudbury, MA: Jones & Bartlett.

McGonigle, D., & Mastrian, K.G. (2012). *Nursing informatics and the foundation of knowledge* (2nd ed.). MA: Jones & Bartlett Learning.

Pendergrast, M. (2012). *Inside the outbreaks: The elite medical detectives of the epidemic intelligence service (at CDC).* New York: Houghton Mifflin Harcourt.

Porta, Miquel. (Ed.). (2014). *A dictionary of epidemiology* (6th ed.). New York: Oxford.

Remington, P.L., Brownson, R,.C., & Wegner, M.V. (2009). *Chronic disease epidemiology and control* (3rd ed.). Washington, D.C.: American Public Health Association.

Riegelman, R.K. (2012). *Studying a study and testing a test: How to read the medical evidence* (6th ed.). Hagerstown, MD: Lippincott Williams & Wilkins.

Rothman, K.J. (2012). *Epidemiology: An Introduction.* New York: Oxford.

Roueche, B. (1982). *The medical detectives.* New York: Washington Square Press.

Saba, V., & McCormick, K. (2006). *Essentials of nursing informatics* (4th ed.). New York: McGraw Hill.

Salkind, N.J. (2011). *Statistics for people who (think they) hate statistics* (4th ed.). Thousand Oaks, CA: SAGE.

World Health Organization. (2014). *World health statistics 2014.* Geneva:WHO.

PREREQUISITES: Undergraduate statistics course with a grade of C or better

COURSE DESCRIPTION:

This is an epidemiology methods course designed with the broad perspective required for determination of the distribution and determinants of health and illness in human population groups. One focus is on the information systems, data sets and algorithms used in solving health problems and finding solutions needed for evidence-based practice. Knowledge required for being a critical consumer of research reports in professional literature is an additional focus. Designing health promotion and disease prevention strategies for important local, national, and global health problems is also stressed.

COURSE OBJECTIVES:

Upon successful completion of the course, students will be able to:

1. Discuss uses of epidemiology in health care practice and scientific

inquiry.

2. Identify the major health problems in the U.S.A. and other parts of the world along with risk factors, distribution, and strategies for their prevention.
3. Describe the major epidemiologic study designs, giving strengths and weaknesses of each one.
4. Define the steps for investigation of an epidemic.
5. Explain the criteria for decisions on usefulness of screening programs.
6. Describe the major statistical tools of epidemiology.
7. Critically evaluate research reports in professional literature.
8. Identify strategies for use of information systems and data bases to improve individual and population health outcomes.

TEACHING/LEARNING METHODS:

Problem-based, collaborative, learning in small groups; seminar discussion; internet searches; informatics/data base exploration; health assessment of population groups; online assignments.

EVALUATION:

Course grades are based on the following numerical equivalencies:

A = 93-100	C = 73-76.99
A- = 90-92.99	C- = 70-72.99
B+ = 87-89.99	D+ = 67-69.99
B = 83-86.99	D = 63-66.99
B- = 80-82.99	D- = 60-62.99
C+ = 77-79.99	F = 59.99 and below

COURSE REQUIREMENTS:	**% OF GRADE**
1. Three open book examinations. Each one counts as 10% of the final grade.	30%

2. Three epidemiologic critiques of assigned research reports in recent epidemiology literature. Each one counts as 10% of the final grade.	30%
3. Transformation of a workspace at the current employment facility to visibly be a health promotion/disease prevention site, based upon observations providing evidence of need.	15%
4. An op-ed piece, in first person, on the impact of bioinformatics/nursing informatics/information technology on your personal future professional practice.	15%
5. Class participation - substantial contributions to class discussions and group presentations.	10%
	100%

Detailed instructions for the requirements will be provided.

TOPICAL OUTLINE:

The study and practice of epidemiology

Pioneers in the discipline of epidemiology

Epidemiology fieldwork assignments

Epidemiology study designs - retrospective, cross-sectional , prospective, experimental clinical and field trials

Major statistical tools of epidemiology

Investigation of vital data resources

Tabular and graphic presentation of data

Evaluation of epidemiological research reports in professional literature

Surveillance activities - from local tracking of hereditary defects to international swine and avian flu watch

Epidemic intelligence and surveillance services of CDC

Medical detectives: EIS Officers at CDC

Morbidity and Mortality Weekly Reports (MMWR) from CDC

The National Center for Health Statistics

The web of causation of disease

Synergism of genetic and environmental forces in disease causation

Infectious disease epidemiology

GPS tracking of disease outbreaks

Cell phone use for health education

Chronic disease epidemiology

Social epidemiology: The effects of social and behavioral characteristics on health and illness in population groups

Epidemic investigation algorithm

Epidemic curve interpretation

Information technology in health care

Bioinformatics tools and strategies

Nursing Informatics

Evidence-based practice algorithms from epidemiology research reports

Association of variables vs. causation of disease

Effective screening programs

Case finding for genetic abnormalities in at-risk populations

Methodologies for health assessment of population groups

Personal workspace as a health promotion site

U.S. Preventive Services Task Force

Human Genome Epidemiology Network at CDC

Students with Disabilities

Students who wish to request accommodations in this class for a disability should contact the Academic Support Center, located on the first floor of Monocacy Hall (extension 1401). Accommodations cannot be provided until authorization is received from the Academic Support Center.