CAMPUS SENATE AY 2005/2006
RESOLUTION 36-2

Proposal for Graduate Certificate in Epidemiology
in the Master of Public Health (MPH) Department

WHEREAS, the M.P.H. Department has proposed a Graduate Certificate in
  Epidemiology [20 credit hours]; and
WHEREAS, the Graduate Council approved their request at the meeting of April
  12, 2006;
THEREFORE, BE IT RESOLVED that the Campus Senate of the University of
  Illinois at Springfield hereby approves the Graduate Certificate in
  Epidemiology.
A. **Purpose of certificate: Objectives and Learning Outcomes**

This is a competency-based graduate certificate designed to provide continuing education opportunities for health professionals to function efficiently in their practice. The training of competent public-health professionals has never been more urgent. The Pew Health Professions Commission who defined acceptable standards of skills and competencies for contemporary public health practitioners recognized this urgency. In addition, the global nature of public health problems, and the essential role of public health professionals as one of the frontline responders in a health-related emergency make these graduate certificates essential for strengthening the public health workforce.

This certificate will strengthen and supplement the program by allowing those without formal public health training, those interested in life-long learning, and mid-career professionals an avenue to enhance their knowledge and skills, as well as an opportunity for individual professional growth.

The learning objectives are in section C and Appendix A.

B. **Target audiences**

Applicants could be individuals who are non-degree seeking health professionals at the local, state, and federal level, or professionals from other for-profit and non-profit agencies, interested in enhancing their competencies and/or skills in this area of specialty.

C. **Proposed curriculum:**

The certificate requires successful completion of all the listed coursework. Students may complete the certificate requirements on a part-time basis within a cycle of three to four semesters. A minimum of a "B" grade is required for all courses. A course is failed when any grade less than a B is attained, and the course could be repeated once. The courses are offered on campus at least once a year during the fall, spring, or summer semesters.

**Graduate Certificate in Epidemiology [20 credit hours]**

Courses: Biostatistics for the Health Professional, Foundations of Epidemiology, Computer Applications in Public Health, Laboratory Sciences in Public Health, Infectious Disease Epidemiology, and Analytical Epidemiology/Health Economics.

Learning objective: Students completing the *graduate certificate in epidemiology* will develop analytic and computer skills to quantitatively relate theory necessary for specialized roles within public health practice. Students completing the certificate shall be able to:

- Apply the basic public health sciences including biostatistics and epidemiology to understanding surveillance and control of infectious diseases, and investigating an outbreak.
- Determine appropriate use of data and statistical methods for interpretation and making relevant inferences of public health data.
- Learn how to apply the principles and tools of epidemiology, healthy economics, and the laboratory aspects of public health to illuminate overall health assessment of communities.
- Practice statistical data analysis and know basic research designs used in public health.
**Required Courses:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPH 503</td>
<td>Biostatistics for the Health Professional</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>MPH 511</td>
<td>Foundations of Epidemiology</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>MPH 405</td>
<td>Computer Applications in Public Health -online</td>
<td>2 hrs</td>
</tr>
<tr>
<td>MPH 428</td>
<td>Laboratory Sciences in Public Health</td>
<td>2 hrs</td>
</tr>
<tr>
<td>MPH 514</td>
<td>Analytical epidemiology or Health economics</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>MPH 515</td>
<td>Infectious disease epidemiology</td>
<td>4 hrs.</td>
</tr>
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</table>

**D. Relation to degree programs:**

Majority of the courses are offered within the MPH on-campus curricula. Courses are the same as for the existing full graduate degree programs.

**E. Occupational and/or student demand:**

The Department of Health and Human Services [DHHS] 1997 report “The Public Health Workforce: An Agenda for the 21st Century”\(^1\) advocated for a system with a stronger government public health workforce. This DHHS 1997 report broadened the operational definition of public health regardless of organization. At the state level, many employees in environment, agriculture, or education departments have public health responsibilities and are included. In the public sector, responsibilities for public health functions are shared among multiple agencies.

A recent 2005 study by the same agency documented deficiencies in competencies and training of public health workers\(^2\). Some lacked knowledge in the core public health concepts. The study recommended continuing education programs for those with no formal public health training. Such training should include and emphasize the core functions of public health: assessment [community diagnosis], policy development and leadership; and assurance of access to environmental, educational and personal health services. The study, also, criticized the research-oriented training by most schools of public health. The proposed graduate certificates should address the shortfall in training disclosed by this report.

There will continue to be a strong demand for public health practitioners including environmental health workers. There could be a shortage of public health employees in a few years due to retirements and the aging population of this workforce (mean age: 46.6 years).\(^3\)

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F. **Staffing and resource requirements:**
No additional resources are required. The faculty responsible for teaching these courses are: Drs. Shahram Heshmat, Remi Imeokparia and Jim Veselenak.

G. **Administrative issues:**
1. **Responsible Administrative unit**

2. **Admissions**
   a) **Eligibility**
   Individuals with bachelors’ degrees from accredited colleges and universities are eligible to apply for admission to graduate study at the UIS, and will qualify for admission to take these certificates.

   b) **Admission process**
   Applicants for the Graduate Certificate must have been admitted to the university. Applicants who have completed the department graduate certificate application will be considered by the admissions committee. Background in the biological sciences demonstrated by transcript credit of at least three semester hours is desirable. Admission will be based on an overall GPA of 3.0 on a 4-point scale.

   Applicants, while pursuing the certificate, may decide to apply these courses toward the full degree, but must meet all Department requirements before acceptance into the MPH program. Applicants who have completed one or more of these graduate certificates and are interested in the full MPH degree must also meet all Department requirements before acceptance into the MPH program.

3. **Advising:**
   Advising will be provided for each student. Upon admission to the graduate certificate program, each student will be assigned a faculty adviser within the appropriate area of specialty.

4. **Tracking:**
   Tracking files will be available in the MPH program.
APPENDIX A.
Epidemiology Certificate: Course descriptions and objectives

1. MPH 405 Computer Applications in Public Health (2 Hrs.)
This course will provide the basic practical concepts and computer techniques for analyzing health-related data. Topics include introduction to commonly used software systems in public health (specifically EPI-INFO software, the latest CDC version), simple statistical analysis, and interpretation of results.

Learning objectives

- Create a sample questionnaire form for data entry.
- Perform data entry for presentation and summarization.
- Practice using the software for simple data analysis.
- Produce files for export to other statistical systems such as SPSS.
- Make sense of analyzed data.

2. MPH 428 Laboratory Science in Public Health (2 Hrs.)
Provides an understanding of laboratory science as it applies to public health. Topics include the history and role of the public health laboratory; tests and procedures used in monitoring the health of the population, and the organization of the laboratory; water and air quality; food preparation and sanitation; waste disposal; vector control; and appropriate personnel standards.

Learning objectives

- Clearly understand the role of the laboratory in the public health arena.
- Know the history and mission of the public health laboratory.
- Know the types of tests and services provided by the public health laboratory.
- Enhance oral and written communication skills through essays, presentations and in-class discussions.

3. MPH 503 Biostatistics for the Health Professional (4 Hrs.)
Provides a general overview of statistical methods commonly used in the collection and analysis of health research data. Topics include descriptive statistics, basic concepts of probability, statistical inference, analysis of variance (ANOVA), correlation, regression, distribution free methods, and introduction to use of a statistical software. Emphasis is on understanding and applying statistical concepts intuitively to the interpretation of health research data. A working knowledge of algebra is required.

Learning objectives

- Organize, display, and analyze data in SPSS.
- Summarize data using measures of central tendency and variations.
- Know basic concepts of probability, normal distribution, and sampling distribution of means.
- Make statistical inferences as applied to sample means using t-tests & ANOVA, proportions using chi-square tests.
- Make inferences about nonparametric tests.
- Distinguish between correlations and regressions.

4. MPH 511 Foundations of Epidemiology (4 Hrs.)
Introduction to epidemiological concepts and methods. Considers the meaning and scope of
epidemiology and the uses of morbidity, mortality, and other vital statistics data in the scientific appraisal of community health. See ENS 561.

**Learning objectives**

- Describe uses and applications of descriptive and analytical epidemiology.
- Use the concept of descriptive epidemiology to analyze an outbreak investigation.
- Understand and describe basic epidemiologic study designs.
- Make relevant inferences from data by recognizing the roles of chance, bias and confounding in the interpretation of studies.
- Critique and evaluate journal articles.

**5. MPH 514 Analytical Epidemiology** (4 Hrs.)

Presents the fundamental concepts, principles, and methods of observational epidemiologic research. Practical issues in the design, conduct, and analysis of epidemiologic studies, as well as theoretical issues in the analysis and interpretation of research findings will be discussed. Intended for students interested in epidemiologic research. Prerequisites: MPH 511, or permission of instructor. See ENS 571.

**Learning objectives**

- Know design considerations and analysis of case-control & cohort studies.
- Know methods of sampling, and sample size determination.
- Evaluate sources and effects of error in epidemiologic measurement.
- Know statistical techniques, including regression models, for analyzing epidemiologic data.
- Collect data and design an epidemiologic study.

**6. MPH 515 Infectious Disease Epidemiology** (4 Hrs.)

Examines the epidemiology of selected infectious diseases including sexually transmitted diseases (STDs) and foodborne diseases. The conceptual background of epidemiologic methods will be applied to understanding the natural history, prevention, and control of these diseases. The role of routine surveillance of infectious diseases and the epidemiology of outbreak investigations will be discussed. Prerequisite: MPH 511, or permission of instructor.

**Learning objectives**

- Learn the etiology, modes of transmission, surveillance, prevention and control of selected infectious diseases.
- Know unique concepts and definitions of infectious disease epidemiology.
- Know factors that contribute to the emergence of new infectious diseases.
- Use the method of detection and analysis of outbreaks for a case study.
- Participate in an infectious disease related program or conference.

**7. MPH 575 Health economics** (4 Hrs.)

The course includes two parts. Part one provides an introduction to the basic principles of economics, particularly as they apply in the public health field: A systematic introduction to microeconomic theory including the determinants of supply and demand, the theory of markets, and the concept of economic efficiency. Part two of the course is designed to introduce students to the basic principles of economic evaluations. This part introduces students to the theory, methods, and applications of economic evaluation in the health context.

**Learning objectives**

- Apply the economic concepts as a managerial tool in making choice.
- Assess the nature and importance of economic evaluations in identifying health prevention instruments.
- Develop analytical and quantitative skills