

FEB 12 2016

MARYLAND HIGHER EDUCATION COMMISSION  
ACADEMIC PROGRAM PROPOSAL

**PROPOSAL FOR:**

- NEW INSTRUCTIONAL PROGRAM
- SUBSTANTIAL EXPANSION/MAJOR MODIFICATION
- COOPERATIVE DEGREE PROGRAM
- WITHIN EXISTING RESOURCES or  REQUIRING NEW RESOURCES

*(For each proposed program, attach a separate cover page. For example, two cover pages would accompany a proposal for a degree program and a certificate program.)*

**Johns Hopkins University**

\_\_\_\_\_  
Institution Submitting Proposal

**Fall 2016**

\_\_\_\_\_  
Projected Implementation Date

**Master of Applied Science (MAS)**

**Spatial Analysis for Public Health**

\_\_\_\_\_  
Award to be Offered

\_\_\_\_\_  
Title of Proposed Program

**1215-00\***

**45.0702**

\_\_\_\_\_  
Suggested HEGIS Code

\_\_\_\_\_  
Suggested CIP Code

**Bloomberg School of Public Health**

**Michael Klag, Dean**

\_\_\_\_\_  
Department of Proposed Program

\_\_\_\_\_  
Name of Department Head

**Philip Tang**

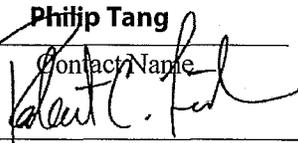
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Contact Phone Number



**02/11/2016**

\_\_\_\_\_  
President/Chief Executive Approval

\_\_\_\_\_  
Signature and Date

**N/A**

\_\_\_\_\_  
Date Endorsed/Approved by Governing Board

\_\_\_\_\_  
Date

\*reflects new, distinct program area in the school



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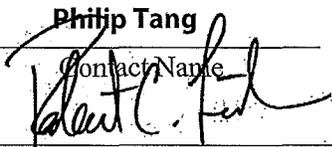
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**The Johns Hopkins University  
Bloomberg School of Public Health  
Proposal for New Academic Program**

**Master of Applied Science in Spatial Analysis for Public Health**

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**A. Centrality to institutional mission statement and planning priorities**

**1. Program description and alignment with mission**

The Johns Hopkins University Bloomberg School of Public Health (JHSPH) is pleased to submit a proposal for a new Master of Applied Science (MAS) in Spatial Analysis for Public Health. Offered by the Online Programs for Applied Learning (OPAL), in collaboration with the Departments of Epidemiology and Biostatistics, the newly proposed program will be delivered online and is intended for part-time students.

The MAS in Spatial Analysis for Public Health program will provide learners with training in epidemiology and biostatistics, courses that reflect the breadth of public health, practical skills derived from workshops in professional development, and spatial analysis through the comprehensive spatial science paradigm of spatial data, geographic information systems, and spatial statistics.

**2. Alignment with institutional strategic goals**

The mission of The Johns Hopkins University is to educate its students and cultivate their capacity for life-long learning, to foster independent and original research, and to bring the benefits of discovery to the world. The mission of the Johns Hopkins Bloomberg School of Public Health is to improve health through discovery, dissemination, and translation of knowledge and the education of a diverse global community of research scientists and public health professionals. The proposed program is consistent with both missions and is well aligned with many of the School's strategic goals:

- *Prepare leaders in public health science and practice to address current and future public health challenges.* It is a goal of the proposed program to provide skills-based education in spatial analysis to the global public health workforce.
- *Promote, value, and achieve excellence in teaching and learning.* The Bloomberg School aims to combine technology with modern-day pedagogy to retain the same high standards that it incorporates into all of its academic programs.
- *Advance the evidence base for the practice of public health and strengthen local, national, and global partnerships with public health practitioners.* Through the proposed master's degree program, the Bloomberg School will offer advanced training in spatial analysis relevant to addressing public health problems. The part-time, online structure of the program will allow the School to reach a global constituency of learners.

- *Raise awareness of public health in the global community.* The proposed curriculum includes courses introducing learners to the breadth of public health.

Bloomberg School, which provides unmatched opportunities for advanced training, focuses on both local and global issues, and prepares students to address public health problems through multidisciplinary approaches that apply the latest scientific knowledge.

The program will provide students with the skills to understand, map, analyze, and interpret spatial data as they relate to public health. The program follows the School's Spatial Science paradigm, which includes three components: (i) spatial data, *i.e.*, collecting, creating, and obtaining spatial data; (ii) Geographic Information Systems, which refers to software for spatial data manipulation, integration, and mapping; and (iii) spatial statistics, which are the tools to statistically analyze spatial data. The proposed program will equip students with the necessary tools to anticipate and directly engage in the rapidly changing role of spatial analysis in public health discovery and practice.

## **B. Adequacy of curriculum design and delivery to related learning outcomes**

### **1. Program outline and requirements**

A full course listing with course titles and descriptions is provided in Appendix A.

The proposed program requires students to successfully complete 52 credits, including a culminating experience. The program will consist of required core courses in epidemiology, biostatistics, and spatial analysis, as well as professional development workshops and public health seminars. The program can be completed over a minimum of nine 8-week terms to a maximum of 4.5 years.

*time to degree*

Most courses must be taken for credit and a letter grade. There will be a pass/fail option for the public health seminars, labs, and professional development workshops. To maintain satisfactory academic performance and good academic standing, students in this program must maintain a minimum grade point average of 2.75.

The proposed program will culminate in a final Integrative Activity. The goal of the activity is for students to synthesize knowledge and skills obtained through coursework in a final project that demonstrates their mastery of the program competencies. Students will articulate a public health question or issue to be addressed, identify a dataset to be used for analysis, and provide evidence of analysis and interpretation of the data in the form of a final paper.

Admission standards will be consistent with that of other master's degree programs in the Bloomberg School. Academic transcripts, TOEFL (where applicable), letters of recommendation, and statements of purpose will all be carefully considered in the admissions process.

*admission standards*

## 2. Educational objectives and student learning outcomes

The goal of the MAS in Spatial Analysis for Public Health program is to prepare spatial data to address public health problems.

Upon completion of the MAS in Spatial Analysis for Public Health, students will be able to:

- Interpret and critique epidemiologic studies addressing public health problems.
- Apply measures of morbidity and mortality to the evaluation and comparison of the health of populations.
- Synthesize how geography affects public health.
- Obtain and transfer information from spatial data technologies into a database appropriate for mapping.
- Utilize a geographic information system to map and spatially integrate public health related databases.
- Analyze and interpret maps using tools from the field of spatial statistics to describe and interpret distributions of health outcomes in a population.
- Design and implement a spatial analysis protocol for addressing a public health problem.

*Educational  
objectives*

## 3. General education requirements

Not applicable.

## 4. Specialized accreditation/certification requirements

Not applicable.

## 5. Contractual agreements with other institutions

Not applicable.

## C. Critical and compelling regional or statewide need as identified in the State Plan

### 1. Demand and need for program

A 2013 survey of leaders of local health departments across the U.S. assessed data needs among the public health workforce. Results demonstrated “an urgent need for more timely and more geographically specific data at the neighborhood or census tract level to efficiently and effectively address the most pressing problems in public health.”<sup>1</sup>

Moreover, the same survey asked about challenges to advancing a public health workforce agenda. Among the top five challenges, respondents identified the need for improved content, structural and delivery mechanisms for distance-based learning.<sup>2</sup>

<sup>1</sup> Castrucci BC, Rhoades EK, Leider JP, Hearne S. What gets measured gets done: An assessment of local data uses and needs in large urban health departments. *J Public Health Management Practice* 2015;21(1 Supp):S38-S48.

<sup>2</sup> Kaufman NJ, Castrucci BC, Pearsol J, et al. Thinking beyond the silos: Emerging priorities in workforce

Online education in spatial analysis for public health will provide the public health workforce with the skills to obtain, analyze, and interpret the type of data that will facilitate addressing important public health issues while enabling learners to remain in the workforce while obtaining that training.

The MAS in Spatial Analysis for Public Health will prepare current and future health practitioners, researchers, policymakers, and scholars to address complex public health, science, and health care challenges. For example, used as part of the public health professional's toolkit, spatial analysis can:

- Visualize and communicate geographical information and assess the effect of geography on public health
- Enhance every aspect of public health practice, from study design and analysis to intervention, prevention, control, and policy efforts
- Offer objective methods to address detection of suspected clusters of disease
- Identify and map food deserts
- Identify the leading edge of an infectious disease outbreak before it becomes a recognized outbreak
- Generate sampling frameworks in underdeveloped countries that do not currently have capacity for census and other population-based geographic data.

Graduates of the MAS in Spatial Analysis for Public Health program will be equipped to drive the responsible development of new knowledge and new ways of saving lives and improving health to further progress across core disciplines in science and technology, and public health and medicine in Maryland, and beyond.

## **2. Alignment with the 2013–2017 Maryland State Plan for Postsecondary Education**

The 2013-2017 Maryland State Plan for Postsecondary Education articulates six goals for postsecondary education: 1) quality and effectiveness; 2) access, affordability and completion; 3) diversity; 4) innovation; 5) economic growth and vitality; and 6) data use and distribution. The proposed program addresses many of these goals.

The program furthers Goal 2 by providing a fully online, part-time degree designed for working professionals seeking additional training or credentials. While focused on spatial analysis, multiple professional workshops will provide students with skills that are transferable to many work environments. The typical student will take 6 credits each term and complete the 52-credit degree in 2-2.5 years.

The program supports Goal 3 through a commitment to the fundamental belief that all students, regardless of their backgrounds or personal attributes, should have access to,

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development for state and local government public health agencies. *J Public Health Management Practice* 2014;20(6):557-565.

and feel welcome in, high-quality educational programming. The University regularly evaluates progress towards this goal and the program will maintain policies, practices and services that serve the diverse population of Maryland.

The program promotes Goal 4 by preparing students to apply a spatial science paradigm to problems of public health through an innovative design and focus. While built upon the School's existing spatial design curriculum, each course within the program has been redesigned, as has the course sequence. The program seeks to reduce costs and improve learning "by transforming the way that instruction is delivered and learning environments are designed." The "new modes of delivery and programmatic initiatives" will serve the State's increasingly diverse student population and advance the State's goal of being a "national and international leader in higher education."

The program promotes Goal 5 by helping Maryland meet the challenges of a changing workforce by addressing the need for more people in the workforce with recognized credentials. Program graduates will stimulate economic growth, innovation, and vitality by supporting a knowledge-based economy and advancing research. The program's advisory board will incorporate feedback from professional organizations and public health stakeholders to ensure that the program is aligned with workforce needs.

#### **D. Quantifiable and reliable evidence and documentation of market supply and demand in the region and State**

##### **1. Market demand**

The MAS in Spatial Analysis for Public Health program will provide students with a pathway to career opportunities in government, non-profits, industry, academia, policy, or research. Many hospitals and other health services delivery organizations conduct analyses of their service areas in order to strengthen their delivery of population-based disease prevention and curative services. Geospatial trends in disease burden and/or exposures can be addressed by the skills on which this program is designed to focus.

*indeed.com*  
These and similar employment opportunities are available nationwide. A recent search for employment on the job site indeed.com revealed 1,582 active job postings where training in geospatial analysis is a preferred qualification.

In addition, conversations with leaders at the Association of State and Territorial Health Officials revealed that job applicants who have training in spatial analysis are viewed as having a valuable credential that improves the likelihood that they will be hired.

##### **2. Educational and training needs in the region**

Prior to the current academic year, the Bloomberg School of Public Health offered only two courses in Spatial Analysis. Student enrollment in these courses has steadily increased each year; in AY2014-15, the introductory-level course enrolled 130 students, necessitating a second section to be offered. Consequently, the faculty developed an

additional two courses, thus expanding the offerings for AY2015-16 to a four-course sequence to meet student demand for training in this area.

Projected admissions for the master's program are as follows:

Year 1: 35 students  
Year 2: 35 students  
Year 3: 35 students  
Year 4: 35 students  
Year 5: 35 students

#### **1. Prospective graduates**

Most students admitted for the Fall 2016 term are expected to complete the program by 2018. 28 students are expected to graduate in 2018, and each year thereafter.

### **E. Reasonableness of program duplication**

#### **1. Similar programs**

To our knowledge, there is no other graduate degree program in spatial analysis for public health offered in Maryland. The JHU Krieger School of Arts and Sciences offers a Master of Science in Geographic Information Systems that is designed to encourage decision-making that is based on the use of GIS technologies, however it does not have a public health focus. Salisbury University has a Master of Science in GIS Management program that builds on its undergraduate program in geography and geosciences, which serves to prepare students for a career in the administration of Geographic Information Systems. The University of Maryland offers an undergraduate program in Geographical Sciences and a graduate program in Geospatial Sciences which are focused on the geospatial perspective of the changing planet and its sustainability.

#### **2. Program justification**

The proposed MAS in Spatial Analysis for Public Health will provide the knowledge and tools necessary for graduates to become critically engaged in investigating and addressing longstanding and emerging public health issues that have local, national, and global import.

In addition to serving some students as an entrance to advanced degrees, the program will serve others as a terminal master's program that can lead students directly to academic, industrial or government positions, or to obtain promotions in positions already held.

The program will be grounded in real-world challenges and informed by leading edge scholarship, with a diverse faculty of the leading experts in the field and a student body bringing life experiences to the classroom.

## **F. Relevance to Historically Black Institutions (HBIs)**

An appropriate student for the MAS in Spatial Analysis for Public Health program would institution, including any of Maryland's Historically Black Institutions. The proposed program would not directly affect the implementation, maintenance, uniqueness, identity or mission of these institutions.

## **G. Evidence of compliance with the Principles of Good Practice**

See Appendix B for the evidence that this program complies with the Principles of Good Practice noted above.

## **H. Adequacy of faculty resources**

Program faculty hold full-time or adjunct appointments in the Bloomberg School of Public Health or the Welch Medical Library. See Appendix C for a representative list of faculty who have expressed willingness to teach courses and serve as mentors in the proposed program. Program faculty have been recognized for their excellence in teaching and produced leading public health research while continuing to generate path-breaking scholarship.

## **I. Adequacy of library resources**

The book collections at the Sheridan Libraries at the Johns Hopkins University include more than 3.7 million volumes, selected to support the academic and research interests of all departments and divisions of the University. The libraries provide 24/7 access to a rich collection of electronic resources, including over 171,000 print and e-journals, and more than 900,000 e-books. All faculty and students have access to online databases in addition to a distinguished collection of research resources. The interlibrary loan department makes the research collection of the nation available to faculty and students. The libraries offer a variety of instructional services, including orientation tours, and electronic classrooms designed to explain the library resources available for research and scholarship. MAS in Spatial Analysis for Public Health students will have access to all libraries and library informationists.

## **J. Adequacy of physical facilities, infrastructure and instructional equipment**

The Bloomberg School has 26,567 square feet of classroom and student study space. Each classroom has a computer and LCD projector. The School has robust student support services, including a fully staffed information technology team and more than 1,000 computers located in computer labs and throughout main buildings for student use. As described further in Appendix B, online program offerings will be developed, delivered, and supported via the School's Center for Teaching & Learning (CTL) using a proprietary course management system, CoursePlus, which is the course delivery platform for all of the Bloomberg School's online credit-bearing courses.

**K. Adequacy of financial resources with documentation**

See Appendix D for detailed financial information.

**L. Adequacy of provisions for evaluation of program**

Program level evaluation activities will include an annual assessment of program inputs, processes and outputs to generate a report on program applicants and admitted students, course enrollment, faculty participation, pedagogical innovations and program accomplishments/recognition.

Evaluation of student learning and achievement will focus on the early identification of students' goals/objectives and individualized learning outcomes; students' acquisition of knowledge and skills and the degree to which the program is fostering students' achievement of the degree competencies as demonstrated by each student's electronic learning portfolio. Post-degree professional and academic accomplishments of graduates will also be tracked through Exit and Alumni Surveys that are conducted for all degree programs at the School.

Student course evaluations, conducted at the end of each term, will provide feedback about both courses and faculty. The evaluations include questions addressing the course overall, the instructor and the assessments of learning.

**M. Consistency with the State's minority student achievement goals**

Any student meeting the admissions requirements can apply to Master of Applied Science in Spatial Analysis for Public Health program. The program will work to help all accepted students improve their workplace competitiveness and reach their professional goals, an aim consistent with the State's minority student achievement goals.

**N. Relationship to low productivity programs identified by the Commission**

Not applicable.

## Appendix A

### **600.xxx.86 Public Health Statistics I (4 credits)**

Provides students with a broad overview of Biostatistical methods and concepts used in the public health sciences. Emphasizes the interpretation and conceptual foundations of statistical estimation and inference. Covers summary measures, measures of association, confidence intervals, p-values, and statistical power. The statistical software package R will be introduced in the class and utilized to demonstrate the concepts and methods with data.

### **600.xxx.86 Introduction to Epidemiology (4 credits)**

Introduces principles and methods of epidemiologic investigation of diseases. Illustrates methods by which studies of the distribution and transmission of diseases in populations (including disease outbreaks and epidemics) can contribute to an understanding of etiologic factors and modes of transmission. Covers various study designs, including randomized trials, case-control and cohort studies, as well as risk estimation and causal inference. The course also discusses applications of Epidemiology to solving public health problems, such as identifying sources and strategies for control of disease outbreaks, applying research findings to policy and practice, and program evaluation. Quantitative and analytic methods covered during the course include life tables, disease surveillance, measures of morbidity and mortality, and measures of diagnostic test accuracy.

### **600.xxx.86 Public Health Statistics II (4 credits)**

Employs a conceptual framework to highlight the similarities and differences between linear, logistic, Poisson and Cox Proportional Hazards methods, in terms of usage and the interpretations of results from such models. Provides details for these regression approaches in the “simple” scenario, involving relating an outcome to single predictor. Following this overview of simple regression, explores the use of multiple regression models to compare and contrast confounding and effect modification, produce adjusted and stratum-specific estimates, and allow for better prediction of an outcome via the use of multiple predictors. Students will learn to use the statistical software package R to fit linear, logistic and Poisson regression models.

### **600.xxx.86 Intermediate Epidemiology (4 credits)**

Expands knowledge beyond introductory level epidemiologic concepts and methods material, using examples from the published literature. Emphasizes interpretation and the ability to critically evaluate issues related to populations/study design, measurement, population comparisons and inference, including: modern cohort study designs; advanced nested designs; novel techniques for exposure assessment; interpretation and utility of measures of impact; sources of bias and methods for their prevention; descriptive and analytical goals for observational study inference; the counterfactual model for defining exchangeability, cause, and confounding; and synthesis of inferences from observational studies as compared with randomized clinical trials.

**600.xxx.86 Spatial Analysis for Public Health (4 credits)**

Introduces the field of spatial analysis for public health. Concepts are examined through the use of ArcGIS Geographic Information System (GIS) mapping software as a tool for integrating, manipulating, and displaying public health related spatial data. GIS topics covered include mapping, geocoding, and manipulations related to data structures and topology. Introduces the spatial science paradigm: Spatial Data, GIS, and Spatial Statistics. Selected case studies are used to demonstrate concepts along the paradigm. Focus is on using GIS to generate and refine hypotheses about public health related spatial data in preparation for follow up analyses.

**600.xxx.86 Spatial Data Technologies for Mapping (4 credits)**

Examines technologies for collecting, obtaining and creating spatial data. Technologies considered include, but are not limited to: GPS, tablets, tracking devices, cell phones, mHealth, Google Earth, remote sensing applications, and the internet. Integrates spatial data from the aforementioned technologies into ArcGIS for spatial analysis. Other GIS related software applications such as QGIS, ERDAS, and Rare introduced. Covers relevant properties of spatial data such as metadata, confidentiality/disclosure and spatial data accuracy. Covers additional topics and concepts that reinforce the spatial science paradigm: Spatial Data, GIS, and Spatial Statistics.

**600.xxx.86 Applied Spatial Statistics (4 credits)**

Introduces statistical techniques used to describe, analyze and interpret public health related spatial data. Included will be methods for characterizing clustering, cluster detection and spatial variation in health related outcomes and events. Three well known types of spatial data, geostatistical data, point event data, and area-level data, will be defined and used to motivate presented material. Regression methods previously learned will be adapted to the spatial setting. The statistical software package R will be used for analysis. Covers additional topics and concepts reinforcing the spatial science paradigm: Spatial Data, GIS, and Spatial Statistics.

**600.xxx.86 Spatial Applications (4 credits)**

Provides an opportunity for students to gain a working knowledge of resources for conducting spatial analysis (i.e., literature, software, and data). Introduces new and relevant topics in GIS, spatial data technologies and spatial statistics not previously covered in the OPAL spatial analysis series. Expands students' abilities to design and conduct spatial analysis by applying knowledge and tools learned from the previous three OPAL spatial analysis courses by providing data for reproduction, and in some cases extension, of analyses from existing studies.. Focuses on further developing and integrating components of the spatial science paradigm: Spatial Data, GIS and Spatial Statistics.

**600.xxx.86 Spatial Analysis Labs**

This course will integrate spatial tools and concepts with epidemiology and biostatistics. The course design emphasizes practice and application towards preparing students for their MAS Integrative Activity. This course will extend GIS concepts and skills previously learned with more hands-on practice with epidemiological applications. Focus will be on translating an epidemiological problem or setting into a set of spatial objectives that align with our spatial

science paradigm. Time will be spent surveying and summarizing the literature on spatial applications in public health. Students will work towards designing a protocol to help identify a public health problem and accompanying data for their MAS Integrated Activity.

**600.xxx.86 Workshops in Professional Development (2 credits)**

Each 2-credit workshop will focus on a specific professional development topic. Students are expected to take several sections of the course, in order to obtain training in a variety of areas (specific OPAL degree requirements will dictate the number of credits required). Workshop topics will include, but not be limited to: presentation of research findings, grant writing, manuscript writing, time management, delivering effective scientific presentations, and leadership.

**600.xxx.86 Seminars in Public Health (3 terms required, 2 credits each)**

Senior faculty present public health topics of current interest, such as those related to global health, health promotion and disease prevention, health care delivery systems, environmental issues and the spectrum of factors influencing the health status of populations and communities.

**600.xxx.86 Integrative Activity (4 credits required; additional credits as needed)**

This culminating experience will provide students with the opportunity to synthesize lessons learned via the application of concepts and techniques to: (i) the identification of a public health problem addressable with spatial analysis; (ii) analysis of a dataset; and (iii) summarization of findings.

## Appendix B

### Evidence of Compliance with the Principles of Good Practice

(as outlined in COMAR 13B02.03.22C)

#### (a) Curriculum and Instruction

- (i) **A distance education program shall be established and overseen by qualified faculty.**

The proposed program will be offered by the Johns Hopkins Bloomberg School of Public Health (JHSPH) and facilitated by the JHSPH Center for Teaching and Learning (CTL). CTL offers an array of evidence-based programs and services that support innovative teaching methods encouraging critical thinking skills online. JHSPH faculty experts will lead and support the development of online courses. Several program faculty members are experienced in developing and supporting online training, including the Program Director, who has taught online courses since 2007.

- (ii) **A program's curriculum shall be coherent, cohesive, and comparable in academic rigor to programs offered in traditional instructional formats.**

All online courses will adhere to CTL's formal course development process with support from experienced instructional designers. Online coursework will follow well-established curriculum development standards, tailoring delivery methods, content, and assessments to learning objectives. As outlined in section L, the electronic portfolio will be used to assess students' achievement of program competencies. The program will also utilize the School's established electronic course evaluation system.

- (iii) **A program shall result in learning outcomes appropriate to the rigor and breadth of the program.**

The program learning outcomes are derived from input from professionals within the discipline, the program faculty, program leadership and other program stakeholders and reviewed by the School's Committee on Academic Standards.

- (iv) **A program shall provide for appropriate real-time or delayed interaction between faculty and students.**

The proposed program will be delivered via CoursePlus, JHSPH-CTL's course delivery and management system. This platform supports both asynchronous and synchronous interaction between faculty, students, teaching assistants, and technical support staff. Technologies available as part of the program include web-conference office hours and live-chats, supported by JHU's Adobe Connect platform.

- (v) **Faculty members in appropriate disciplines in collaboration with other institutional personnel shall participate in the design of courses offered through a distance education program.**

Faculty members are selected based on domain expertise, program-related teaching experience and completion of required course development training. Faculty will be fully supported by CTL experts.

**(b) Role and Mission**

- (i) **A distance education program shall be consistent with the institution's mission.**

Please see section A.1 of the proposal.

- (ii) **Review and approval processes shall ensure the appropriateness of the technology being used to meet a program's objectives.**

All the courses in the program are designed with the support of an instructional designer, multimedia producers, and web specialists. The instructional designer and multimedia specialists assist in identifying and recommending the most effective learning technologies for achieving the course learning objectives. The course instructor and instructional designer create a Course Design Matrix that identifies the learning components of the course and how the course will be facilitated to achieve optimal student learning outcomes. This iterative process goes through several levels of review, including approval by the Committee on Academic Standards prior to course production. The CTL design team continually monitors courses and consults with the instructors to make adjustments, if needed. All new online courses participate in a midterm and end-of-term course evaluation process. The midterm feedback is used to determine if any mid-term adjustments are needed. The end-of-term feedback is used to assess whether further course refinements are needed prior to the next time the course is offered.

**(c) Faculty Support**

- (i) **An institution shall provide for training for faculty who teach with the use of technology in a distance education format, including training in the learning management system and the pedagogy of distance education.**

The program is supported by CTL, which offers a number of opportunities and resources for faculty instructors and teaching assistants to become more familiar with online teaching systems and best pedagogical practices. In addition to maintaining an extensive catalog of resources on these topics (an online Teaching Toolkit), CTL regularly offers events, workshops, and one-on-one office hours to introduce and provide updates on the latest advances in teaching technology and pedagogy. In addition to one-on-one guidance from an instructional designer, all faculty will participate in an online teaching orientation session and receive a reference manual to support their teaching.

- (ii) Principles of best practice for teaching in a distance education format shall be developed and maintained by the faculty.**

Prior to teaching their first courses, all new online instructors will be required to participate in training that conveys, among other things, principles of best practices in online education. The principles will also be described in the above noted reference manual.

- (iii) An institution shall provide faculty support services specifically related to teaching through a distance education format.**

The Bloomberg School, through CTL, maintains an innovative course management system and provides faculty support and training for distance education through a staff of more than 30 individuals who specialize in instructional design, audio production, technical writing, web development, production management and quality control.

- (d) An institution shall ensure that appropriate learning resources are available to students including appropriate and adequate library services and resources.**

The Johns Hopkins University library system includes The William H. Welch Medical Library in the School of Medicine, the Abraham M. Lilienfeld Library in the School of Public Health, and the Milton S. Eisenhower Library on the Homewood campus. Most periodicals, including more than 13,000 journal subscriptions and multiple databases and catalogs, are available to University Faculty, staff and students online from any location in the world. The interlibrary loan department also makes the research collection of the nation available to faculty and students. The libraries offer a variety of instructional services, including electronic classrooms designed to explain the library resources available for research and scholarship. Students have access to all libraries and library informationists.

- (e) Students and Student Services**

- (i) A distance education program shall provide students with clear, complete, and timely information on the curriculum, course and degree requirements, nature of faculty/student interaction, assumptions about technology competence and skills, technical equipment requirements, learning management system, availability of academic support services and financial aid resources, and costs and payment policies.**

The Bloomberg School maintains numerous web-based resources to inform prospective students on the information they may need as an online student. These resources include the School's main website and online catalog, which includes detailed programmatic information, academic support services, financial aid, costs, policies, etc. and specific information for online learning. In addition, web pages specific to this program will provide prospective students with clear and updated

information regarding relevant aspects of the program. As new online students are admitted and enrolled, they receive timely emails with important information to help them prepare to become an online student. These emails include information

technical requirements, available academic support services and new online student orientation course. This course, Introduction to Online Learning, described further below in section e. (iii), is designed to ensure that students, and their computers, are prepared to take online courses offered through the School. The course takes between one and four hours to complete.

**(ii) Enrolled students shall have reasonable and adequate access to the range of student services to support their distance education activities.**

JHSPH online students have access to the following academic support services:

- *Academic Advising.* Students are assigned an academic advisor when accepted. In addition to completing formal coursework, students will work individually with their advisor to develop an Integrative Activity project that meets the requirements of the program and the career goals of the student.
- *Library Services.* Students have online access to the Johns Hopkins Sheridan Libraries, which include the William H. Welch Medical Library in the School of Medicine and the Milton S. Eisenhower Library on the Homewood campus. The interlibrary loan department allows students access to resources at any other university in the nation. The library also provides easy access to a wide selection of electronic information resources, including the library's online catalog, and numerous electronic abstracting and indexing tools. Many of the databases are accessible remotely. Librarians are available to assist students remotely and the library maintains an extensive web site to take visitors through all its services and materials.
- *Services for Students with Disabilities.* The Johns Hopkins University is committed to making all academic programs, support services, and facilities accessible to qualified individuals. Students with disabilities who require reasonable accommodations can contact the JHSPH Office of Disability and Support Services.
- *Johns Hopkins Student Assistance Program.* The Johns Hopkins Student Assistance Program (JHSAP) is a professional counseling service that can assist students with managing problems of daily living. Stress, personal problems, family conflict, and life challenges can affect the academic progress of students. JHSAP focuses on problem solving through short-term counseling. Accessing the service is a simple matter of a phone call to arrange an appointment with a counselor. Online students may call a phone number for consultation and will be directed to the appropriate resource or

office. JHSAP services are completely confidential. The program operates under State and Federal confidentiality legislation and is HIPAA compliant.

of the student at a nominal charge.

- *Student ID Card. Student Login IDs.* The University issues each student a Johns Hopkins Enterprise ID (JHED ID) and the School issues a JHSPH ID. The JHED ID grants students a JHU email address and secure access to many online services including course registration, bill payment, official grades, library services, and the online learning platform, *CoursePlus*. Students are also issued a JHSPH ID that provides access to the School's intranet (My JHSPH), where students can locate additional resources including research and administrative tools as well as the School's policies and procedures manuals.

**(iii) Accepted students shall have the background, knowledge, and technical skills needed to undertake a distance education program.**

All accepted online students are required to have met the admission requirements stated for the degree program. New online students are required to complete the "Introduction to Online Learning" course prior to beginning their first online course. This course covers a broad range of topics on how to be a successful online student such as: online student learning expectations, and how to participate in online discussions.

**(iv) Advertising, recruiting, and admissions materials shall clearly and accurately represent the program and the services available.**

All relevant program information is kept up to date on the School's web site at [www.jhsph.edu](http://www.jhsph.edu).

**(f) Commitment to Support**

**(i) Policies for faculty evaluation shall include appropriate consideration of teaching and scholarly activities related to distance education programs.**

Faculty teaching online courses are strongly encouraged to participate in one or two professional development opportunities annually to improve their online teaching skills.

- (ii) An institution shall demonstrate a commitment to ongoing support, both financial and technical, and to continuation of a program for a period sufficient to enable students to complete a degree or certificate.**

The Bloomberg School has a commitment to online teaching as demonstrated by CTL's resources, which provide course development, instructional, and technical support to new and current faculty. See also Appendix D for detailed financial information regarding the proposed program.

**(g) Evaluation and Assessment**

- (i) An institution shall evaluate a distance education program's educational effectiveness, including assessments of student learning outcomes, student retention, student and faculty satisfaction, and cost-effectiveness.**

See section L of the main proposal.

- (ii) An institution shall demonstrate an evidence-based approach to best online teaching practices.**

The School's Center for Teaching and Learning continually participates in professional development activities to keep abreast of evidence-based approaches to online teaching practices. These online teaching practices are then incorporated into the new online instructor training sessions.

- (iii) An institution shall provide for assessment and documentation of student achievement of learning outcomes in a distance education program.**

As part of the online course design process, course assessments are required to be aligned with stated course learning objectives. The proposed program will incorporate tailored assessments that demonstrate students' application of learned skills. Program faculty have experience with developing assessments for measuring the acquisition of relevant knowledge and skills through online learning.

## Appendix C

### Faculty

\*Alphabetical order. While faculty leads are identified, some courses will be team taught by multiple faculty.

Faculty	Title/Academic Rank	Status	Courses
Frank Curriero, PhD	Associate Professor JHSPH Department of Epidemiology (joint appointment: JHSPH Department of Biostatistics)	Full-time	Applied Spatial Statistics  Spatial Applications  Spatial Analysis Labs 1&2
Elizabeth Golub, PhD, MPH	Associate Scientist JHSPH Department of Epidemiology Director, Online Programs for Applied Learning	Full-time	Intermediate Epidemiology  Seminars in Public Health
John McGready, PhD	Associate Scientist JHSPH Department of Biostatistics	Full-Time	Public Health Statistics 1  Public Health Statistics 2
Ian Saldanha, PhD	Assistant Scientist JHSPH Department of Epidemiology	Full-time	Introduction to Epidemiology
Timothy Shields, MA	Assistant Scientist JHSPH Department of Epidemiology	Full-time	Spatial Analysis for Public Health  Spatial Data Technologies for Mapping  Spatial Applications
Claire Twose, MLS	Associate Director, Public Health and Basic Science Informationist Services Welch Medical Library	Full-time	Professional Development Workshop

**Appendix D**  
**Finance Information**

TABLE 1: RESOURCES					
Resource Categories	2016	2017	2018	2019	2020
1. Reallocated Funds	-	-	-	-	-
2. Tuition/Fee Revenue (c + g below)	\$621,180	\$1,278,900	\$1,317,960	\$1,357,020	\$1,398,600
a. Number of F/T Students	-	-	-	-	-
b. Annual Tuition/Fee Rate	-	-	-	-	-
c. Total F/T Revenue (a x b)	-	-	-	-	-
d. Number of P/T Students	35	70	70	70	70
e. Credit Hour Rate	\$986	\$1,015	\$1,046	\$1,077	\$1,110
f. Annual Credit Hours	18	18	18	18	18
g. Total P/T Revenue (d x e x f)	\$621,180	\$1,278,900	\$1,317,960	\$1,357,020	\$1,398,600
3. Grants, Contracts & Other External Sources	-	-	-	-	-
4. Other Sources	-	-	-	-	-
<b>TOTAL (Add 1 – 4)</b>	<b>\$621,180</b>	<b>\$1,278,900</b>	<b>\$1,317,960</b>	<b>\$1,357,020</b>	<b>\$1,398,600</b>

**Resources narrative:**

1. Reallocated Funds: No reallocation of existing resources will be required.
2. Tuition and Fee Revenue: Projected revenue is based on an incoming class of 35 students, with total class size projected to increase by 35 students each year. Tuition is projected to increase by 3% annually.
3. Grants and Contracts: No grant or contract support is anticipated.
4. Other Sources: Funds from a donor will bridge the revenue/expense gap during the first year.

<b>TABLE 2: EXPENDITURES</b>					
<b>Expenditure</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
1. Faculty (b + c below)	\$141,225	\$282,450	\$302,625	\$302,625	\$302,625
a. # Sections offered	7	14	15	15	15
b. Total Salary	\$105,000	\$210,000	\$225,000	\$225,000	\$225,000
c. Total Benefits	\$36,225	\$72,450	\$77,625	\$77,625	\$77,625
2. Admin. Staff (b + c below)	\$ 31,722	\$ 32,356	\$ 33,003	\$ 33,663	\$ 34,337
a. # FTE	0.25	0.25	0.25	0.25	0.25
b. Total Salary	\$ 23,585	\$ 24,057	\$ 24,538	\$ 25,029	\$ 25,529
c. Total Benefits	\$ 8,137	\$ 8,300	\$ 8,466	\$ 8,635	\$ 8,808
3. Support Staff (b + c below)	\$94,150	\$72,731	\$49,943	\$51,440	\$52,982
a. # FTE	1	0.75	0.5	0.5	0.5
b. Total Salary	\$70,000	\$54,075	\$37,132	\$38,245	\$39,392
c. Total Benefits	\$24,150	\$18,656	\$12,811	\$13,195	\$13,590
4. Equipment	–	–	–	–	–
5. Library	–	–	–	–	–
6. New or Renovated Space	–	–	–	–	–
7. Other Expenses	\$190,000	\$245,000	\$100,000	\$ 60,000	\$ 60,000
<b>TOTAL (Add 1 – 7)</b>	<b>\$457,097</b>	<b>\$632,537</b>	<b>\$485,571</b>	<b>\$447,728</b>	<b>\$449,944</b>

**Expenditures narrative:**

1. Faculty: Includes the costs of faculty support for the proposed program. The benefits rate is 34.5%.
2. Administrative: No additional administrative costs will be needed for the program.
3. Support Staff: Includes the costs for program coordination (full-time and casual personnel) and teaching assistants. The benefits rate is 34.5% for full-time personnel and 8% for casual personnel.
4. Equipment: No additional equipment is needed for the proposed program.
5. Library: No additional library resources are needed for the proposed program.
6. New or Renovated Space: No additional space is needed for the proposed program.
7. Other Expenses: Includes instructional supplies, marketing and travel expenses, as well as phone, and other operating costs necessary for the day to day function of the proposed program. This also includes costs for online course development and technology to support online courses.

