NOTICE OF INTENT
Master of Science in Biostatistics
Zilber School of Public Health

Name of the proposed degree: Master of Science in Biostatistics
Institutional setting: Joseph J. Zilber School of Public Health
University of Wisconsin, Milwaukee
Mode of delivery: Blended
Other required approvals: None
Institutional contact: Dev Venugopalan, Vice Provost
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Background

According to the Council on Education for Public Health (CEPH), Biostatistics represents one of the core disciplines in Public Health. UW-Milwaukee's Joseph J. Zilber School of Public (UWM’s Zilber SPH) currently offers five Master of Public Health tracks and three PhDs. The faculty proposes to expand the research and impact of our Biostatistics faculty and students by implementing a Master of Science (MS) degree in Biostatistics. A Master of Science (MS) degree in Biostatistics represents (1) a clear milestone for students to attain on their way to a PhD in Biostatistics; and (2) a way to attract students to UWM interested in a technical masters-level degree with high marketability. This degree aligns well with current course offerings at the Zilber SPH, UWM, and the UW system, and addresses the mission of UWM to serve as both a research hub, as well as an access University for Southeastern Wisconsin.

Program Description

The Biostatistics Master of Science degree program is designed to train students in the implementation of techniques, methods, and tools to conduct public health research and practice using rigorous statistical, bioinformatics, and general quantitative methods. Faculty interest areas include: bioinformatics, statistical genetics, network analysis, causal inference, bio-statistical methods, and high throughput computing. Students entering the program will be trained at the graduate level in the analysis of data from genetics and genomics, electronic medical records, and population-based epidemiological studies. Such training will include approaches requiring large populations, large data sets, and as needed, the collection, processing and analysis of data used in the pursuit of improving the public’s health. Graduates of this program will be able to participate and execute the study design, data collection, analysis, and dissemination of results. Technical areas include database management, causal inference, network analysis, medical and population genetics, as well as tools and techniques for acquiring, processing, warehousing, and analyzing public health data. The MS in Biostatistics will include core courses in Public Health and Biostatistics methods and electives.

Projected Source of Resources

The Biostatistics MS program will build upon existing biostatistics MPH coursework that has been offered in the Zilber School of Public Health. Other required courses such as epidemiology are available from the Zilber School of Public Health. The MS program will
enrich its curriculum in the areas of biomedical informatics and genomics through “S”elective courses, such as computing programs and health informatics (e.g., COMPSCI 431, HCA741) from the Department of Electronic Engineering and Computer Science, molecular biology and functional genomics (e.g., BioSci 566, 572) from the Department of Biological Sciences. The existing relationship between the Zilber School of Public Health, Aurora Health Care, and the Medical College of Wisconsin also provide students with excellent opportunities for the practice of statistical consultation.

Alignment with Institutional Mission and Strategic Plan
An MS in Biostatistics in the Zilber School of Public Health at UWM will contribute to fulfilling UWM’s mission to be a top-tier research university. The program also aligns well with the UWM Select Mission Statement in the following ways (www4.uwm.edu/discover/mission.cfm):

- The MS in Biostatistics will be a high-quality degree delivered by faculty with established success in research and teaching. A masters-level research degree in biostatistics is an important offering for the only comprehensive school of public health in Wisconsin.
- Masters-level statisticians and biostatisticians are a critical component of many research teams. The MS in Biostatistics will help to fulfill the need for this skill set in research efforts at UWM and beyond.
- Biostatistics is an extremely marketable degree, which will attract high-caliber students interested in pursuing careers in a wide range of settings, including government, hospital systems, and pharmaceutical companies.
- Projects and internships undertaken by MS students in local organizations, such as health departments or hospital systems, will help to build relationships between those organizations and the Zilber SPH (and UWM as a whole).

Alignment with Existing Program Array at UWM
UWM’s Zilber SPH currently offers a doctoral concentration and MPH track in Biostatistics, providing an enriching setting for the MS Biostatistics students to join. The students will be exposed to cutting-edge research by the Biostatistics faculty and the career growth potential of graduate education. Existing graduate coursework from the Department of Mathematical Sciences in UWM, as well as Biostatistics PhD program in MCW also offer opportunities for advanced “S”electives for interested MS Biostatistics students.

Need for Master of Science in Biostatistics in the Context of Local, Regional, and System-Wide Programs
UWM’s Zilber SPH is on track for accreditation in 2016-17 by the national public health accrediting body: The Council on Education for Public Health (CEPH). CEPH standards require a Master of Public Health (MPH) degree in Biostatistics, so UWM launched the MPH track in Biostatistics in Fall 2014. Delivering an MS in Biostatistics appeals to students, particularly in a CEPH-accredited School of Public Health setting. It is common to offer an MS in Biostatistics in the context of a school of public health, and the trajectory in healthcare and personalized medicine continues to move toward population-based preventative care. A school of public health trains Biostatistics MS students through that lens. Compared to the current MPH track in Biostatistics offered at UWM, the MS degree is more attractive; at other CEPH-accredited schools of public health offering both an MPH and MS in Biostatistics, student demand is much greater for the MS. An MS is a natural supplement to the PhD degree now offered in Biostatistics at the Zilber SPH.
**UW System programs**
The University of Wisconsin-Madison offers an MS degree in Biostatistics. The proposed MS at UWM will complement the UW-Madison MS degree by emphasizing curriculum and applications in public health.

**Milwaukee-area programs**
The Medical College of Wisconsin offers an MS degree in Biostatistics as an option for their PhD students.

**Regional programs**
Within the region, the University of Illinois at Chicago, Northwestern University, the University of Iowa, the University of Minnesota, the University of Michigan, Michigan State University, and Indiana University-Purdue offer MS degrees in biostatistics. This aligns with the market demand for this degree and prevalence in schools of public health.

**Summary of Student and Market Demand**

The MS in Biostatistics is fast growing, and the number of applications among U.S. and international students is increasing quickly. Currently, the 51 biostatistics programs that offer MS degrees nationwide awarded 659 degrees during 2015, an increase of 100% from 2010 in which 327 degrees were conferred. We anticipate that the MS degree will attract more students locally and internationally than the current MPH degree track in biostatistics.

Students with an MS in Biostatistics are employable in a wide variety of settings, including in the governmental sector, at research universities and non-profit institutions, in the pharmaceutical and biomedical industry, and within health systems, such as health insurance companies, hospitals, and other large healthcare companies. According to the Bureau of Labor Statistics, there are 30,000 jobs available for statisticians/biostatisticians in 2014, with a median annual income of $80,110. Jobs are projected to increase 34% during the next 10 years. The typical entry-level educational requirement for a job as a statistician or biostatistician is an MS degree. The skills gained in this new MS program will enable students to be competitive in this robust job market.

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