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GEORGIA

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University Council

January 14, 2022

UNIVERSITY CURRICULUM COMMITTEE – 2021-2022

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Undergraduate Student Representative – Matthew Jue

Graduate Student Representative – Sarah Burns

Dear Colleagues:

The attached proposal from the College of Public Health for a new Undergraduate Certificate in Public Health Data Fluency will be an agenda item for the January 21, 2022, Full University Curriculum Committee meeting.

Sincerely,

Susan Sanchez, Chair

University Curriculum Committee

cc: Provost S. Jack Hu
Dr. Rahul Shrivastav

PROPOSAL FOR A CERTIFICATE PROGRAM

Date: September 2, 2021

School/College/Unit: College of Public Health

Department/Division: Epidemiology and Biostatistics

Certificate Title: Undergraduate Certificate in Public Health Data Fluency

Effective Term: Fall 2022

Which campus(es) will offer this certificate? Athens

Level: Undergraduate

CIP: 30700101

Program Abstract:

The Undergraduate Certificate in Public Health Data Fluency housed in the College of Public Health (CPH), Department of Epidemiology and Biostatistics, is a college-wide initiative to develop undergraduate data fluency skills for public health undergraduate students. This includes data ethics, data management, analysis, and the role of data in society to promote public health using data-driven insights. Students who complete the certificate will gain new skills in directly working with public-use public health data, generating insights, and telling stories verbally, in writing, and with data visualizations using software. The certificate will be valuable for students pursuing public health concentrations, private sector health careers, and health social sciences with an emphasis in quantitative data analysis.

1. Purpose and Educational Objectives

State the purpose and educational objectives of the program. How does this program complement the mission of the institution?

The proposed Undergraduate Certificate in Public Health Data Fluency is responsive to the President's Intensive Writing and Data Literacy Initiative, which identified learning opportunities in defining, identifying, analyzing, and communicating data insights, as well as the role that data plays in society. Social processes create disparities in who is trained on and who is exposed to health data – and when that training begins. The certificate fulfills the University Diversity and Inclusion mission of “enhancing diversity awareness and education through training and learning opportunities for [students] throughout the university” through coursework that describes societal data-generating processes in the public, private, and academic sectors that may result in marginalization of subpopulation data and/or data atrophy in which the absence of data reflects a problem (e.g., absence of hate crime, gun and sexual violence, and opioid epidemic data, to name a few).

The objectives of the Undergraduate Certificate in Public Health Data Fluency are to:

- Prepare undergraduate students with foundational skills in data management that are core competencies to contribute in the public and private sector workforce as an analyst or as a leader of an analyst team.
- Identify and select data appropriate to an inquiry.
- Conduct analysis and interpretation of data in a critical manner.
- Communicate data-based insights.
- Discuss what data are and the role of data in society.
- Differentiate between ethical and unethical use of data.
- Inspire discovery of data-driven graduate degree programs in the health sciences including epidemiology and biostatistics, sociology, journalism, business, and social work.

2. Need for the Program

Explain why this program is necessary. In addition, provide the following information:

- Semester/Year of Program Initiation:** Fall 2022
- Semester/Year of Full Implementation of Program:** Fall 2022
- Semester/Year First Certificates will be awarded:** Academic Year 2022-2023
- Annual Number of Graduates expected (once the program is established):** 30-50 students
- Projected Future Trends for number of students enrolled in the program:** 50-100 students

In addition to the needs defined by the President's Initiative to advance undergraduate data literacy, the College of Public Health has increasingly received alumni feedback that more direct coaching is needed concerning how to work with data and how to use it to make health recommendations to policymakers, lay audiences, and decision-makers. Employers have made this recommendation as well, citing that the most successful undergraduate students demonstrate competency in these domains of data synthesis and communication. The epidemiology faculty have a wide range of specialties and background experience to enhance the quality of course offerings to target interdisciplinary interests of students, including those outside the College of Public Health. Pilot implementation of certificate offerings in free workshop formats to both undergraduate and first year master's students (including students from Public Health, Forestry, and Ecology) indicate a desire for understanding primary and public-use health data structures and developing competency in coaching teams that manage health data products such as by working in collaboration with data scientists. Current undergraduate epidemiology (EPID 4070, Fundamentals of Epidemiology) and biostatistics course offerings (BIOS 2010, Elementary Biostatistics, and BIOS 3000, Intermediate Biostatistics for Public Health Sciences) are highly relevant to data literacy, and new offerings have been developed to enhance opportunities for students to gain applied skills directly working with data and in understanding their social importance to the health workforce.

Projected Future Trends in Enrollment

EPID 4070, Fundamentals of Epidemiology, is typically the first experience that CPH undergraduates have in conducting secondary data analysis of public health data such as public-use, National Health Interview Series data. Approximately 10%-20% of these students indicated in course evaluations a desire to receive additional coaching about how to apply epidemiologic methods to data, and nearly 100% of those students reported an intention to pursue graduate school or other advanced professional degrees. This information was used to project a future enrollment of 50-100 students in the certificate based on 10-20% of the 8-9 sections of EPID 4070, which enrolls approximately 320-400 students each year. A formal survey was conducted to justify these estimates and is reported in the subsequent student demand section.

3. Student Demand

- a. Provide documentation of evidence of student demand for this program, which may include a student survey.
- b. Provide evidence that demand will be sufficient to sustain reasonable enrollment.
- c. To what extent will minority student enrollments be greater than, less than, or equivalent to the proportion of minority students in the total student body?

Epidemiology faculty have piloted new course offerings in existing and First-Year Odyssey formats to identify learning opportunities with substantial positive feedback, including comments like the ones below. Outcomes of these pilot offerings include student reports that they never knew they were good at working with data, and are now considering graduate programs in research as a result. Because several of the existing courses required for the data literacy certificate are required courses in CPH, a data literacy certificate is efficient in recruiting students to enroll in the program. More than 400 undergraduate students enroll in both fundamentals of epidemiology and biostatistics courses each year, which demonstrates an already large potential pool of students.

A formal student survey of the CPH undergraduate population was conducted to inform interest about a certificate that promotes public health data fluency. Students (n=66) responded to the survey and reported substantial interest in the proposed certificate as well as the topic area of the new course offerings - specifically EPID 2100, Health Data Literacy for Public Health Research and Practice, and EPID 3100, Health Data Fluency and Management for Public Health Research and Practice. 97% indicated a desire to pursue graduate or professional school post-graduation, and 79% of students indicated that they expected data analysis to be a core component of their future jobs. The results of the survey are presented in the table below, and key insights that support the importance of the curriculum and need among the student population are summarized in the following bulleted list:

- **62 students (93.9%) reported interest in the new course offerings** that coach how to work with public health data (98.1% of the 52 students who expect to enter data-intensive careers)
- **Among those pursuing data-intensive careers, almost half (42.3%) reported slight comfort in working with data** and only 7.7% reported high competency
- About **4 out of 5 students not expecting to enter data-intensive fields report interest** in the new certificate course offerings

Table 1.CPH Student Survey of Perceived Data Competency and Interest in New Public Health Data Course Offerings (n=66 students)

How comfortable are you in working directly with quantitative data?	Student report pursuing a data-intensive career		
	Yes (n=52)	No (n=14)	Total
Extremely comfortable	4 (7.7%)	0 (0%)	4 (6.1%)
Moderately comfortable	26 (50%)	12 (85.7%)	38 (57.6%)
Slightly comfortable	22 (42.3%)	2 (14.3%)	24 (36.4%)
Would you be interested in new course offerings that prepare you to work directly with public health data?	Student report pursuing a data-intensive career		
	Yes (n=52)	No (n=14)	Total
Yes	51 (98.1%)	11 (78.6%)	62 (93.9%)
No	1 (1.9%)	3 (21.4%)	4 (6.1%)

The First-Year Odyssey program is an ongoing vehicle to reach students who may not have discovered public health and other health-adjacent disciplines. The FYO model will be used as a way to reach students across the university who are interested in training to become proficient with health data.

“... We looked at COVID data and used Excel to manipulate it. I learned some awesome stuff and the course was very interesting.”

“I've thoroughly enjoyed your class. I thought that I was proficient in handling excel but your class has taught me that I've so much more to learn.”

“... Also thank you for teaching us this semester. This class has actually helped me in other classes, so I enjoyed taking it.”

“I am reaching out to receive the information about the [public health data fluency] certificate program. I want to look over it and have it ready before my advisor meeting next week to schedule my classes. I look forward to having more classes again with you soon! I really enjoyed my time in your FYOS and hope to continue to work on my excel and data fluency skills in the future.”

- Students in the 2020 and 2021 First-Year Odyssey Seminar Using Data to Influence in the Public and Private Sectors: A Public Health Perspective

4. Program of Study

Provide a detailed program of study for the certificate program, including:

- a. Specific course prefixes, numbers, and titles**
- b. Identify any new courses created for this program**

Students must earn a grade of at least a “B” in both core and selected elective offerings to be eligible to receive the certificate.

Required Core Courses (10 hours)

BIOS 2010, Elementary Biostatistics (4 hours)

EPID 2100, Health Data Literacy for Public Health Research and Practice (3 hours) – *New course offering*

EPID 3100, Health Data Fluency and Management for Public Health Research and Practice (3 hours)
– *New course offering*

Elective Courses (select at least two courses for 6 hours from the list below)

AAEC 4040-4040L, Statistics for Agribusiness Management (4 hours)

BINF(BCMB) 4005/6005, Essential Computing Skills for Biologists (2 hours)

BIOS 3000, Intermediate Biostatistics for Public Health Sciences (3 hours)

BIOS 3910, Directed Study in Biostatistics (1-3 hours)

BIOS 4960R, Faculty-Mentored Undergraduate Research I** (1-6 hours)

BTEC 3000, Ethics and Communication in Biotechnology (2 hours)

CSCI 1360, Foundations for Informatics and Data Analytics (4 hours)

CSCI 2725, Data Structures for Data Science (4 hours)

CSCI 3360, Data Science I (4 hours)

DIGI 2000 Introduction to Geographic Information Systems (GIS) for the Digital Humanities (1 hour)

EPID 4070, Fundamentals of Epidemiology (3 hours)
GEOG 2011-2011L, Introduction to Geographic Information Science (3 hours)
GEOG 4300/6300, Data Science in Geography (3 hours)
GEOL 4530/6530-4530L/6530L, Principles and Environmental Applications of GIS (3 hours)
HPAM 4410, Introduction to Health Informatics and Analytics (3 hours)
MIST 2090, Introduction to Information Systems in Business (3 hours)
MIST 4000, Data Literacy in Business (3 hours)

Total Hours: 16

**Other faculty-mentored data intensive, research course offerings with approval of coordinator

5. Model Program and Accreditation

a. Identify any model programs, accepted disciplinary standards, and accepted curricular practices against which the proposed program could be judged. Evaluate the extent to which the proposed curriculum is consistent with these external points of reference and provide a rationale for significant inconsistencies and differences that may exist.

The Association of Public and Land-Grant Universities (APLU) and Association for Institutional Research (AIR) launched a pilot program in early 2020 to develop a data literacy program model that can be deployed by colleges and universities across the country. Participating universities in the pilot include Bowling Green State University, Central State University, Illinois State University, Kent State University, Miami University, Montclair State University, Oakland University, Towson University, University of Maine, University of Minnesota-Duluth, Western Michigan University, and Wright State University. Faculty will benchmark and maintain this certificate program according to the standards that these peer universities develop to innovate in University of Georgia undergraduate data literacy offerings as part of the current proposed curriculum in the domains of 1) access and diversity, 2) accountability and transparency, and 3) degree completion and student success. Benchmarking against this standard is important because formal data literacy initiatives across university settings are in their infancy, and the few that do exist are tailored to graduate degree programs rather than to the undergraduate student audience.

b. If program accreditation is available, provide an analysis of the ability of the program to satisfy the curricular standards of such specialized accreditation.

N/A

6. Student Learning Outcomes

Describe the proposed learning outcomes for the certificate program.

The proposed certificate aims to raise undergraduate data fluency in domains relevant for the health sciences in both the public and private sectors. Students who complete the certificate will integrate new tools that raise their data literacy to achieve data fluency, so that they can be effective in using data for influence. New course offerings are tailored to promote academic achievement of data literacy and quantitative reasoning skills, and elective offerings are wide so that students can gain data-for-influence training that is appropriate for their intended field of work, in academia or in the public/private sectors. Certificate learning outcomes map onto the five domains of the President's University-wide Data Literacy Initiative:

- 1. Discuss what data are and the role of data in society.**
 - a. Students should be cognizant of data sources and be able to ascertain the validity of data that are presented to them. Students should know the role data plays in decision making at various levels of society.
- 2. Identify and select data appropriate to an inquiry.**
 - a. Students should be able to identify and select appropriate data for a given level of inquiry.
- 3. Conduct analysis and interpretation of data in a critical manner.**
 - a. Students should be able to select an analysis of the data that allows an appropriate interpretation of that data. This analysis encourages students not only to solve problems that might have mathematical answers, but also to develop policies or strategies that lead to solution of abstract problems.
- 4. Communicate data-based insights.**
 - a. Students should be able to communicate in multiple media modes.
- 5. Differentiate between ethical and unethical use of data.**
 - a. Students as consumers and producers of data should be aware of the ethics of how the data they generate are used, ethical dimensions of data they consume, and legal issues surrounding data. An informed citizen of the 21st century should be aware of the ethical uses and misuses of data.

7. Assessment

Describe how the learning outcomes for the program will be assessed.

Between fall 2019-2021, the department piloted elements of these new offerings in the First-Year Odyssey program and in EPID 4070, Fundamentals of Epidemiology, to determine assessment strategies that are appropriate for measuring data literacy learning outcomes and to understand what pedagogical methods are appropriate for an audience with little exposure to quantitative data. To name a few, classic testing, report writing for a data product, and live role plays were effective in assessing knowledge of key data structure terminology and contemporary societal and ethical issues about the use of data. Applied data analysis was used to test how students independently synthesize insights from publicly accessible data and homework assessments provided students an opportunity to gain experience following through with data-related requests that they will encounter in the workplace. The department will also implement exit surveys in the final year before graduation to receive timely and relevant feedback of the program structure and opportunities to enhance certificate offerings.

Documentation of Approval and Notification

Proposal: Undergraduate Certificate in Public Health Data Fluency

College: College of Public Health

Department: Epidemiology and Biostatistics

Proposed Effective Term: Fall 2022

Department:

- Epidemiology and Biostatistics Department Head, Dr. Jose Cordero, 10/18/2021

School/College:

- College of Public Health Dean, Dr. Marsha Davis, 12/6/2021

Use of Course Notifications:

- Agriculture and Applied Economics Department Head, Dr. Octavio Ramirez, 11/12/2021
- Computer Science Department Head, Dr. Thiab Taha, 11/12/2021
- Digital Humanities Initiative Co-Director, Dr. Claudio Saunt, 12/23/2021
- Entomology Department Head, Dr. S. Kris Braman, 12/10/2021
- Entomology Professor, Dr. Donald Champagne, 11/12/2021
- Geography Department Head, Dr. Hilda Kurtz, 11/12/2021
- Geology Associate Department Head, Dr. Adam Milewski, 11/12/2021
- Institute of Bioinformatics Interim Director, Dr. Travis Glenn, 12/10/2021
- Management Information Systems Department Head, Dr. Maric Boudreau, 11/12/2021
- Microbiology Department Head, Dr. Aaron Mitchell, 11/12/2021
- University Librarian for Writing Programs and Digital Humanities Specialist, Mr. Elliott Kuecker, 11/12/2021