Rebecca and Mike:

The proposals from the College of Public Health to establish a Graduate Minor and Graduate Certificate in Biostatistics were approved by the Council on Academic Affair at its meeting on April 19, 2023.

No additional level of review/approval is necessary. This action will be included in the Council's next Annual Activities Report to the University Senate (July 2023).

The Office of the University Registrar will contact you if there are any implementation issues.

Please keep a copy of this message for your file on the proposal and I will do the same for the file in the Office of Academic Affairs.

If you have any questions, please contact me.

I wish you success with these important new program developments.

Randy

THE OHIO STATE UNIVERSITY

W. Randy Smith, Ph.D.
Vice Provost for Academic Programs
Office of Academic Affairs
203 Bricker Hall, 190 North Oval Mall, Columbus, OH 43210
614-292-5881 Office
smith.70@osu.edu

TO: Randy Smith, Vice Provost for Academic Programs

FROM: Graduate School Curriculum Services

DATE: March 7, 2023

RE: Proposal to establish a Graduate Minor and Graduate Certificate in Biostatistics in the College of Public Health

The College of Public Health is proposing to establish a Graduate Minor and Graduate Certificate in Biostatistics.

The proposal was received by the Graduate School on January 20, 2023. The combined GS/CAA subcommittee first reviewed the proposal on February 13, 2023, and recommended it for approval by the Graduate Council. The proposal was approved by the Graduate Council on March 7, 2023.

Michael S. Bisesi, PhD, REHS, CIH
Vice Dean and Director, Academic Affairs and Academic Administration
Professor and Chair (Interim), Environmental Health Sciences
Fellow, AIHA
(614) 247-8290 bisesi.12@osu.edu

January 20, 2023

Maria N. Miriti, PhD
Associate Dean of Academic Affairs
Graduate School - The Ohio State University
miriti.1@osu.edu

Dear Dean Miriti,

 On behalf of the College of Public Health Division of Biostatistics, we are seeking approval by the Graduate School and the Office of Academic Affairs via the Council on Academic Affairs to offer a Graduate Minor in Biostatistics and a Graduate Certificate in Biostatistics.

The 14 credit graduate minor and graduate certificate programs are based on a subset of competencies and courses from the Division of Biostatistics primarily. The minor will be targeted for Ohio State students pursuing a graduate degree. The standalone certificate (Category 3a) will be targeted towards others who already have at least an undergraduate degree.

There are several programs at Ohio State that cover topics adjacent to the curriculum of the proposed Graduate Certificate and Graduate Minor in Biostatistics but are not comprehensively focused on statistics or applications of statistics in public health. The proposed biostatistics programs differ from these programs in covering statistical methods tailored to applications in public health as well as epidemiological concepts and introducing students to a wider range of statistical software packages. These additions to the University's academic program degree enhancement choices will likely be well-received by emerging and present workforces.

We greatly appreciate favorable University-level reviews and approvals.

Sincerely,

Michael S. Bisesi, PhD CIH
Vice Dean, Academic Affairs and Academic Administration
Professor and Interim Chair, Environmental Health Sciences
College of Public Health

Proposal for ONLINE Type 3a Graduate Certificate and Graduate Minor in BIOSTATISTICS

Program Overview

The Graduate Certificate and Graduate Minor in Biostatistics are graduate programs designed to provide learners with the knowledge and skills for conducting biostatistical analyses in the context of public health applications. The course requirements for the two programs are identical; the Type 3a certificate is for students who have an undergraduate degree and are not currently enrolled in a degree program at OSU, and the minor is for students who are currently enrolled in a graduate degree program outside the College of Public Health. The program consists of coursework in biostatistical analysis, epidemiology, and statistical computing (focused on software packages used for statistical analysis).

Background and Rationale

In a preliminary market scan of degree programs and jobs in biostatistics and data science, biostatistics was the top "hard skill" required in 2,541 unique job postings for management analysts, medical scientists, statisticians, and epidemiologists in Ohio, Indiana, Kentucky, Michigan, Pennsylvania, and West Virginia between August 2020 and August 2021[1]. Data analysis was fourth, epidemiology was fifth, and statistics was sixth. Therefore, this Graduate Certificate/Minor in Biostatistics was designed to equip learners with the background in epidemiologic study design, biostatistics, and statistical computing required for public health data analysis in the public and private sectors. Completion of the program will enhance the learner's credentials to existing or prospective employers by providing evidence of knowledge and skills that can contribute to applied biostatistical analyses.

The *stand-alone graduate certificate* will be attractive to working professionals in the public and private health sectors and to individuals with advanced degrees in health-related fields (e.g., MD, PharmD, nursing PhDs). The *minor* will be attractive to graduate students in the health sciences. Because both groups of individuals already have or are pursuing degrees in their specific areas of expertise, they likely do not have the bandwidth or desire to pursue a graduate degree in biostatistics such as an MS or MPH, which are already available through the CPH and are a minimum of 45 credits. Thus, this certificate/minor consisting of **only 5 classes/14 credits** will be suited to these potential learners.

The program will be offered **100% online** to offer sufficient flexibility for working professionals to pursue the certificate while employed full-time and for currently enrolled graduate students to complete the minor. We will pursue an MOU with ODEE as is required for such programs.

The program would become effective in Autumn 2022 (or in the semester after it is approved). The program is not "lock-step" in that there is flexibility in the order in which several of the courses can be taken, so students can start in either Autumn or Spring semester.

---

[1] College of Public Health Biostatistics and Data Science Preliminary Market Scan (ODEE, October 2021)

Program Goal and Learning Outcomes

The **goal** of the certificate/minor is to prepare learners to understand study designs used in public health research/evaluation and conduct appropriate biostatistical analyses using data collected from such studies.

Learning Outcomes: Upon completion of the certificate/minor, students will be able to:
1. Evaluate study designs and analytical methods commonly used in public health research.
2. Fit and interpret standard regression models using statistical software.
3. Apply data management techniques to prepare data for statistical analysis.

Curriculum

The graduate certificate/minor in biostatistics includes **14 credits of didactic coursework** within the disciplines of biostatistics and epidemiology. As shown below, every student in the program must take four courses in areas of knowledge basic to biostatistics and epidemiology and one course in the area of knowledge basic to statistical software.

Courses	Credits	Term(s) Offered	OSU College
Required (12 credits)			
PUBHEPI 6410 Principles of Epidemiology	3	AU	CPH
PUBHBIO 6210 Applied Biostatistics I	3	AU, SP, SU	CPH
PUBHBIO 6211 Applied Biostatistics II*	3	AU, SP	CPH
PUBHBIO 6250 Regression Methods for the Health Sciences**	3	AU	CPH
Selective (pick 1 course; 2 credits)			
PUBHBIO 6270 Introduction to SAS for Public Health Students	2	AU, SP	CPH
STAT 5730 Introduction to R for Data Science	2	SP	ASC
STAT 5740 Introduction to SAS Software	2	AU	ASC

*Prerequisite: PUBHBIO 6210
**Prerequisite: PUBHBIO 6211

All courses will be offered 100% online. Students will be able to complete the certificate/minor program within 3 semesters (excluding summer) with a course load of 1 to 2 courses per semester. The three-course sequence of PUBHBIO 6210/6211/6250 must be taken in that order, but the other two courses (PUBHEPI 6410 and the selective course) may be taken at any time.

Comparison to Similar Programs

Similar programs at other universities

The preliminary market scan referenced in the Background and Rationale section above identified the following competing programs across the country (tuition current as of April, 2022):
1. The University of Wisconsin, La Crosse offers a *Graduate Certificate in Data Science* that is 100% online with 26 completions in 2020. It requires 5 courses that cover data science, programming, databases, communication, and machine learning. It can be completed in one year with two courses per semester. Tuition is $850 per credit hour. For students who wish to continue their education, the credits are "stackable" into an MS in data science.

https://www.uwlax.edu/grad/data-science/

2. The University of Washington offers a *Certificate in Applied Biostatistics* that is 100% online with 13 completions in 2020. It requires three courses in "medical biometry" over nine months. These cover study designs, statistical tests, regression models, and R programming. Tuition is $5,175 (noncredit) and $10,788 (credit).
   https://www.pce.uw.edu/certificates/applied-biostatistics

3. The University of Louisville offers an *Online Certificate in Biostatistics* that is 100% online with 8 completions in 2020. It requires 5 courses for a total of 15-16 credits (12 in required courses and 3-4 in electives). The required courses include statistical graphics, summary statistics, point and interval estimation, hypothesis tests, regression models, and SAS programming. The electives cover clinical trials or statistical methods for research design. Tuition is $752 per credit hour (or $250 for qualifying members of the military, National Guard, or Coast Guard).
   https://louisville.edu/online/programs/certificate-programs/certificate-in-biostatistics

4. Johns Hopkins offers a *Biostatistics in Public Health Science Specialization Certificate* that is 100% online on Coursera (completions unknown). It requires four courses that take four weeks each. These courses cover statistical graphics, summary statistics, hypothesis testing, point and interval estimation, and regression models. The cost is not specified on the website, but university certificates on Coursera courses typically cost $1000-$3000. Based on reviews on the Coursera website, it appears that this program does not use any statistical software.
   https://www.coursera.org/specializations/biostatistics-public-health

5. Harvard (through Harvard Catalyst) offers an *Applied Biostatistics Certificate: Methods and Applications* that is 100% online. It offers two tracks: core curriculum and core curriculum plus advanced topics. The core curriculum covers statistical graphics, summary statistics, point and interval estimation, hypothesis tests, and regression models. The advanced topics include correlated outcomes, causal inference, prediction modeling, and missing data. Both tracks use Stata. It requires 7-11 months to complete at 4 hrs/week. The cost for non-Harvard affiliates is $2500 (core curriculum) and $4000 (core curriculum and advanced topics).
   https://catalyst.harvard.edu/courses/biostatscertificate/

The proposed Graduate Certificate and Graduate Minor in Biostatistics at Ohio State is more rigorous than the certificate from Johns Hopkins, and it has a stronger focus on biostatistics and public health than the data science certificate at the University of Wisconsin La Crosse. It has a curriculum similar to the certificate programs at the University of Washington, the University of Louisville, and Harvard (core curriculum). However, it has two important advantages over these programs: (1) It allows greater flexibility in statistical software (including R, Stata, and SAS), which is valuable to both graduate students and working professionals. (2) It requires a course in epidemiology, which is critical background knowledge for individuals analyzing data in the public and private health sectors.

Similar programs at Ohio State
There are several programs at Ohio State that cover topics adjacent to the curriculum of the proposed Graduate Certificate and Graduate Minor in Biostatistics.

The Fisher College of Business offers a *Graduate Minor in Business in Health Sciences*. It consists of 12 credit hours in the Summer Semester. The curriculum covers management, business economics, organizational behavior, marketing and accounting. There is also a healthcare business capstone project. This minor includes some data analysis and emphasizes health-related business, but it is not focused on statistics or applications of statistics in public health.

https://fisher.osu.edu/graduate/graduate-minor-business-health-sciences

The Department of Biomedical Informatics in the College of Medicine offers a *Graduate Minor in Biomedical Informatics* and an online *Certificate of Completion in Biomedical Informatics*. Each program has three required courses (9 credit hours) and two electives (6 credit hours). There is substantial overlap in the required and elective courses in the two programs. Both curricula cover concepts from computer science, statistics, anatomy and physiology, medical terminology, clinical trial and tissue repository management, genomics, proteomics, and metabolomics. The primary programming languages are R and Python. These programs more emphasis on computer science and less emphasis on statistics than the proposed programs in biostatistics. The applications of these concepts are also different. The bioinformatics programs place more emphasis on biology and medicine and less emphasis on epidemiology and public health than the proposed biostatistics programs.
https://medicine.osu.edu/departments/biomedical-informatics/education/online-certificate-programs
https://medicine.osu.edu/departments/biomedical-informatics/education/graduate-minor

The Department of Statistics in the College of Arts and Sciences offers two graduate minors: a *Graduate Minor in Statistical Data Analysis* (more applied) and a *Graduate Minor in Statistics* (more theoretical). The Minor in Statistical Data Analysis requires 12 credit hours (7 required and 5 elective). It covers statistical concepts at a level similar to the proposed biostatistics programs, but it does not require exposure to methods such as survival analysis that are required in the proposed biostatistics program, nor does it include any epidemiology. The Minor in Statistics requires 14 credit hours (12 required and 2 elective). It covers statistical concepts with a more theoretical focus than the proposed biostatistics program, but it does not require exposure to some of the statistical methods that are required in the proposed biostatistics program. The primary statistical software used in both Statistics programs is R. The proposed biostatistics programs differs from these programs in covering statistical methods tailored to applications in public health as well as epidemiological concepts, and introducing students to a wider range of statistical software packages. A letter of support from the Statistics Department (see appendix) concurs that the proposed Graduate Minor and Graduate Certificate in Biostatistics addresses a distinct set of methods and applications.
https://stat.osu.edu/graduates/graduate-minors

Assessment

Assessment for the graduate certificate/minor will involve both direct and indirect measures of both program- and student-level components.

Program-Level Assessment

We will collect data on the following program-level measures and monitor them for continuous quality improvement:

- Number of applications (annual)
- Quality of applicant pool (GPA; Diversity)
- Student evaluation of instruction (SEI) scores
- GPA of students enrolled in certificate/minor program courses
- Retention and graduation rates (including time to certificate/minor)
- Survey current and graduating students to assess program satisfaction
- Survey recent graduates to assess applicability of program in their careers

Individual Student-Level Assessment

We will collect data on the following student-level direct measures to assess attainment of each program learning outcome as aligned with the curriculum:

Learning Outcome	Course	Assessment Methods
LO 1: Evaluate study designs and analytical methods commonly used in public health research	PUBHEPI 6410	Exams Final project and presentation
LO 2: Fit and interpret standard regression models using statistical software.	PUBHBIO 6210	Exams Problem sets
	PUBHBIO 6211	Exams Problem sets
	PUBHBIO 6250	Exams Problem sets
LO 3: Apply data management techniques to prepare data for statistical analysis.	PUBHBIO 6270 or STAT 5730 or STAT 5740	Final course project *(all three course options have a final project that assesses this LO)*

Each assessment listed above will be scored using the following rubric:

- Score $\geq$ 90% ($\geq$ A-) – Exceeds Expectations (2)
- Score $\geq$ 80% ($\geq$ B-) – Meets Expectations (1)
- Score < 80% (< B-) – Does Not Meet Expectations (0)

Students will be individually assessed, and scores will be aggregated to create a program-level assessment for each learning outcome.

Administration and Resources

The graduate certificate will be administered by the Division of Biostatistics in the College of Public Health. All decisions related to the specific curricular requirements and the structure of the graduate certificate will be made during Division of Biostatistics faculty meetings, which include all tenure-track and clinical teaching faculty.

All courses proposed for this graduate certificate/minor already exist and have been taught for many years. Several of the courses are offered multiple times per year (PUBHBIO 6210, PUBHBIO 6211). There has been space in all courses for additional students in recent years (actual enrollment lower than the cap), and we do not anticipate that the new certificate/minor will place an undue burden on course instructors. We will explore adding additional sections if course enrollment exceeds planned caps.

Projected Enrollment

The proposed program will be co-marketed internally and externally with other graduate programs offered by the College of Public Health. Current graduate or professional degree-seeking students at the University will be targeted for the minor, and working professionals outside the University will be targeted for the certificate. Current CPH marketing efforts are broad and include outreach to historically underrepresented groups.

Based on the numbers of completions in the mature programs listed above, combined enrollment in the certificate/minor program is anticipated at 10-15 students per year.

Admissions/Requirements

Admissions requirements vary slightly by program type due to differences in but are generally identical:

	Graduate Certificate	Graduate Minor
Admissions Requirements and Process	Minimum of a bachelor's degree Meet all requirements established by the Ohio State University Graduate School for admission to graduate-level academic certificate programs (GRE not required) Apply through CPH. Applications reviewed by CPH Division of Biostatistics Admissions Committee	Currently enrolled in a graduate-level program at Ohio State (excluding CPH degree programs) Submit a Minor and Graduate Interdisciplinary Specialization form in GRADFORMS. The form serves as the student's application.
Minimum Grades	B- or better in all required courses for the certificate	B- or better in all required courses for the minor
Permitted Overlap	Maximum overlap of 6 credits from the graduate certificate program if pursued concurrently with another degree program	Maximum overlap of 1 course if the course is required for both the major and minor

Curriculum Guide for the Graduate Minor in Biostatistics

The Graduate minor in Biostatistics is intended to complement applicable PhD and Master's degree programs across Ohio State University to provide students with fundamental knowledge about biostatistics.

Competencies
Upon completion of the Graduate Minor in Biostatistics, students will be able to:

1. Evaluate study designs and analytical methods commonly used in public health research.
2. Fit and interpret standard regression models using statistical software.
3. Apply data management techniques to prepare data for statistical analysis.

Required Courses (12 credits):		
PUBHEPI 6410 Principles of Epidemiology	3	DL
PUBHBIO 6210 Applied Biostatistics I	3	DL
PUBHBIO 6211 Applied Biostatistics II*	3	DL
PUBHBIO 6250 Regression Methods for the Health Sciences**	3	DL
Selective Courses (pick one courses; 2 credits):		
PUBHBIO 6270 Introduction to SAS for Public Health Students	2	DL
STAT 5730 Introduction to R for Data Science	2	DL
STAT 5740 Introduction to SAS Software	2	DL

* Prerequisite: PUBHBIO 6210
**Prerequisite: PUBHBIO 6211

Requirements

- Must be currently enrolled at Ohio State in a graduate-level program (excluding CPH degree programs)
- The minor requires a minimum of 14 credit hours
- Students must receive a grade of "B-" or better or "S" in each course comprising the minor
- Maximum overlap of 1 course if the course is required for both the major and minor.
- Student must maintain a 3.0 GPA in the courses to successfully complete the minor.

How to declare the minor
In order to officially declare the minor, students should submit a Minor and Graduate Interdisciplinary Specialization form in GRADFORMS. The form serves as the student's application.

For further information contact the Office of Academic Programs and Student Services in the College of Public Health at cph@osu.edu.

THE OHIO STATE UNIVERSITY
COLLEGE OF PUBLIC HEALTH

Curriculum Guide for the Graduate Certificate in Biostatistics

The Graduate certificate in Biostatistics is intended to complement applicable PhD and Master's degree programs across Ohio State University to provide students with fundamental knowledge about biostatistics.

Competencies
Upon completion of the Graduate Certificate in Biostatistics, students will be able to:

1. Evaluate study designs and analytical methods commonly used in public health research.
2. Fit and interpret standard regression models using statistical software.
3. Apply data management techniques to prepare data for statistical analysis.

Required Courses (12 credits):		
PUBHEPI 6410 Principles of Epidemiology	3	DL
PUBHBIO 6210 Applied Biostatistics I	3	DL
PUBHBIO 6211 Applied Biostatistics II*	3	DL
PUBHBIO 6250 Regression Methods for the Health Sciences**	3	DL
Selective Courses (pick one courses; 2 credits):		
PUBHBIO 6270 Introduction to SAS for Public Health Students	2	DL
STAT 5730 Introduction to R for Data Science	2	DL
STAT 5740 Introduction to SAS Software	2	DL

* Prerequisite: PUBHBIO 6210
**Prerequisite: PUBHBIO 6211

Requirements

- Minimum of a bachelor's degree
- The certificate requires a minimum of 14 credit hours
- Students must receive a grade of "B-" or better or "S" in each course comprising the certificate
- Maximum overlap of 6 credits from the graduate certificate program is pursued concurrently with another degree program
- Student must maintain a 3.0 GPA in the courses to successfully complete the certificate.

How to declare the certificate
Current Ohio State students should submit a Certificate application through the College of Public Health. Once coursework is completed, students should notify the Graduate School of courses completed via GRADFORMS.

Non-degree students should apply for admission to the University via Graduate and Professional Admissions.

For further information contact the Office of Academic Programs and Student Services in the College of Public Health at cph@osu.edu.

FW: Graduate certificate and minor in biostatistics

Archer, Kellie J. <archer.43@osu.edu>
Tue 1/3/2023 12:12 PM
To: Bisesi, Michael <bisesi.12@osu.edu>
Cc: Droesch, Kynthia <droesch.4@osu.edu>
Hi Mike,

The Department of Statistics has given concurrence for our online graduate certificate and minor in biostatistics (see below).

Best,
Kellie

From: Craigmile, Peter <pfc@stat.osu.edu>
Date: Tuesday, January 3, 2023 at 12:04 PM
To: Archer, Kellie J. <archer.43@osu.edu>, MacEachern, Steven <snm@stat.osu.edu>
Subject: Re: Graduate certificate and minor in biostatistics

Dear Kellie,

Happy New Year!

A number of our faculty looked over the proposal for the online graduate certificate and minor in biostatistics, and we are happy to give concurrence.   Two items I should let you know about:

1) In the future our plan is to split Stat 5730 into two 1 credit courses that we hope will give students more flexibility in what they want to learn about R. We have not started on the proposal yet, but we hope to offer this starting Spring 2024. We can keep you posted on the progress, if you want.

2) Regardless of the format, we plan to offer Stat 5730 (and revisions) and Stat 5740 (SAS) online in the future.

Please let us know if you have any questions.

Have a great semester,
Peter

Peter Craigmile, Ph.D.,
Professor, Department of Statistics, The Ohio State University.

From: "Archer, Kellie J." <archer.43@osu.edu>
Date: Thursday, December 22, 2022 at 4:48 PM
To: "Craigmile, Peter" <pfc@stat.osu.edu>, "MacEachern, Steven" <snm@stat.osu.edu>
Subject: Re: Graduate certificate and minor in biostatistics

Yes, that works. Thank you!

Sent from my Verizon, Samsung Galaxy smartphone
Get Outlook for Android

From: Craigmile, Peter <pfc@stat.osu.edu>
Sent: Thursday, December 22, 2022 4:38:37 PM
To: Archer, Kellie J. <archer.43@osu.edu>; MacEachern, Steven <snm@stat.osu.edu>
Subject: Re: Graduate certificate and minor in biostatistics

Thank you, Kellie.

It may take some time to get concurrence, as people are currently out of town (including myself).

I will try to get feedback before Jan 5 -- is that okay?

Regards,
Peter

From: "Archer, Kellie J." <archer.43@osu.edu>
Date: Thursday, December 22, 2022 at 3:25 PM
To: "MacEachern, Steven" <snm@stat.osu.edu>, "Craigmile, Peter" <pfc@stat.osu.edu>
Subject: Graduate certificate and minor in biostatistics

Hi Steve and Peter,

Our division has developed an online graduate certificate and minor in biostatistics (see attached).
Briefly, these add-ons are appropriate for individuals in other health-related fields full-time workers in the
health and public health profession who want some training in biostatistics and epidemiology. We expect the
short online programs to garner interest from these working professionals.

We are seeking concurrence from the Department of Statistics. Thank you for your consideration.

Best regards,
Kellie

Memorandum of Understanding

Digital Learning and Student Success

and

College of Public Health Division of Biostatistics

Purpose

This Memorandum of Understanding (MOU) is entered into by and between the Office of Technology and Digital Innovation, Digital Learning and Student Success and the above College/Department to facilitate the launch of the online program outlined below.

Program name: **Graduate Certificate (3A) Biostatistics (BIO)**

                                and

                                Graduate Minor – Biostatistics (BIO)

   ***Note: The curricula and program requirements for the graduate-level certificate (category 3A) and minor are identical. There is only one difference in that (1) the minor may only be pursued by degree-seeking students; and (2) the certificate is a standalone credential that can be pursued by someone with a bachelor's degree.**

Program level: **Graduate**

Approval process (New, Change of Delivery, Certificate): **New programs**

Has this program been approved in the past?   **No**

If Yes, please explain: **Not Applicable**

Will the new approval replace or operate in conjunction with the existing approval?
                                Not Applicable

Will this program have a different fee structure from what would normally be assessed similar students at the university?
        Yes, likely, since it will be 100% online via DL program tuition/fees.

If Yes, please explain: **DL degree programs have a different tuition/fee structure**

Total credit hours for program curricula: **15 credits**

Total number of courses for program curricula: **5 courses**

Percentage of courses offered online: **100% Online**

Onsite Activities:

      Optional (e.g., orientation): **Not Applicable**
      Required (e.g., clinical): **Not Applicable**
Anticipated semester of first implementation cohort: **AU 2023**

Anticipated date to begin recruiting and enrolling: **Marketing w/ anticipated AU 2023 admissions**

Total number of anticipated students, semesterly over the first five years, beginning with the first semester in which you intend to enroll your first cohort:

	Summer	Autumn	Spring	Total
Year 1 AY__**23-24**____	0	10	10	10
Year 2 AY__**24-25**____	10	25	25	15
Year 3 AY__**25-26**____	15	30	30	15
Year 4 AY__**26-27**____	15	35	35	20
Year 5 AY_**27-28**____	20	50	50	30

College/Department Contacts

College/Department:
      Dr. Michael Bisesi bisesi.12@osu.edu
      Vice Dean, College of Public Health
      Dr. Aram Dobalian dobalian.1@osu.edu
      Associate Dean, CPH Graduate Programs
Faculty/Program Director (*responsible for instructor and course coordination*):
      Dr. Kellie Archer archer.43@osu.edu
      Chair, Division of Biostatistics

Primary Contact, if different from Faculty/Program Director:
Kynthia Droesch droesch.1@osu.edu
Director, Office Academic Programs and Student Services

College Fiscal Officer:
Andrea Garringer garringer.11@osu.edu
Assistant Dean, Finance and Administration

Program Marketing Contact:
See "Conduct Marketing to Drive Applications to the Online Program" under Department/College Responsibilities. If no contact is given, the Faculty/Program Director will fill this role.

Todd Thobe thobe.34@osu.edu
Director, Marketing, Recruitment, and Admissions

Contact for State Authorization compliance:
See "Participate in Compliance Activities" under Department/College Responsibilities. If no contact is given, the Faculty/Program Director will fill this role.

Dawn Williams williams.3388@osu.edu
Assistant Director, Office of Academic Programs and Student Services

Additional college/contacts: **Not Applicable**

Term of MOU

This MOU will begin effective **January 1, 2023** and will be discussed and reaffirmed every three years at the start of the next fiscal year on July 1, however continual dialogue will ensue to ensure the involved parties are evaluating the partnership. This MOU does not automatically renew. At the end of this term **December 31, 2025** a new MOU will be created. Should the online program end at any time, the DE budget model will remain in effect for three years from the end point of the online program in order for the budget model to self-adjust and close, given that the budget model operates on a one-year lag, two-year average from the start of the online program.

Digital Learning and Student Success Responsibilities:

The Office of Technology and Digital Innovation (OTDI) entering into this agreement will partner with Colleges to:

Secure Approval

1. Consult and recommend options as state authorization related considerations arise

    a. Consult and support college understanding of rules and regulations

    b. Engage in prioritization strategy to support the unit's goals

    c. Communicate the program's authorization status to the college

Program Administration

1. Consult and recommend best practices for course approval, student labeling, and budget forecasting.

Participate in Compliance Activities

1. Actively monitor regulations and participate in regional and national state authorization networks to provide recommended best practices to seek and maintain required authorizations.

Partner to Build Online Courses Based on Best Practice

1. OTDI will collaborate with the college at least one semester prior to each course's first offering term on the curricular and technical solutions for online course design based on best practice by providing expertise on the following:

    a. Elements of course format, rigor, and integrity that affect delivery mode, based on university policies (tracking attendance with at least one student activity each week, credit hour equivalency), federal policies, and accreditation standards

b. Best practices for promoting and maintaining the academic integrity of the courses, including assignment design and technical solutions

c. Course templates that provide students with consistent, clear navigation and online course expectations based on best practices

d. Formats and platforms for course activities and materials that are supported by university technical requirements and optimal for distance delivery

e. Evidence-based recommendations about teaching strategies in online courses

f. Technical and instructional mechanisms that facilitate the program's assessment of student learning across courses

2. Provide instructional design consultation and production support for each course, including an initial semester-long (14-week) offering of support, tailored to the instructor's needs and any program requirements. OTDI will plan for staffing availability based on the course design schedule (see Appendix C: Course Design Schedule). This schedule will be confirmed with the Faculty/Program Director each semester and support for instructors/courses added to the schedule after confirmation is received, or for instructor changes, will be provided as OTDI's staffing allows.

3. Collaborate with the college to provide support for course revision with current instructors every three years following the initial instructional design support term.

4. Share expertise on accessibility best practices expected for courses of all modalities at Ohio State and provide referrals to local Accessibility Coordinator.

5. Provide professional learning opportunities for faculty/instructors/students through OTDI and in ongoing partnership with other campus units; promote these opportunities directly with program instructors.

6. Provide additional consultation to instructors associated with the program (as indicated in the attached course design schedule or updated by a program Faculty/Program Director or other contact), including:

a. Opportunities for consultation from the instructional design team before, during, or after the first term when a course is taught following OTDI course design support

b. Consultation and pathways for professional learning for additional instructors who begin teaching a course before the scheduled three-year revision support

THE OHIO STATE UNIVERSITY

Office of Technology and Digital Innovation
it.osu.edu

Conduct Marketing to Drive Applications to the Online Program

1. Digital Learning and Student Success marketing is the unit responsible for promoting the Ohio State Online sub-brand and its programs. A Digital Learning and Student Success marketing representative will work with leaders from each program, internal stakeholders and external agencies to design an annual, individualized marketing plan best suited to drive perspective students to a program.

   Digital Learning and Student Success marketing services include:

   a. A presence on online.osu.edu that includes web development and copywriting (all programs)

   b. Inclusion in digital and non-digital brand marketing campaigns (all programs)

   c. Program-specific marketing

      i. Tactics that may be employed include digital advertising, traditional advertising, written and visual storytelling, student journey mapping, and landing page development, among other strategies. (See Appendix D: Scope of Work).

      ii. Market research insights can be provided to inform program demand, identify competitors, determine alumni outcomes and more.

2. Partner with programs, where applicable, to submit data to the *U.S. News and World Report* for Best Online Programs Rankings Survey

Note: Marketing will only be conducted in states/countries in which the program has been authorized

Provide Student Support to Online Learners

1. Actively engage in discussions with stakeholders across campus to promote the support of distance education students and research national trends in distance education student support

College/Department Responsibilities:

College/Department entering into this agreement will partner with OTDI to:

1. Engage with the Digital Learning and Student Success Marketing Team to conduct market research to understand program viability and inform program development.

THE OHIO STATE UNIVERSITY

Office of Technology and Digital Innovation
it.osu.edu

Secure Approval

1. Secure approval from the following, where applicable:

    a. Department: **Yes**

    b. College: **Yes**

    c. Graduate School: **Pending Review/Approval + OTDI MOU approval/signature**

    d. Council on Academic Affairs (CAA): **Pending Review/Approval**

    e. ~~University Senate~~

    f. ~~Board of Trustees~~

    g. ~~Department of Higher Education~~

    h. ~~Accreditation Provider~~

2. Contact the university budget office and request a distance-education-specific fee table. Differential fees must be approved by the Board of Trustees, if applicable.

3. Contact Student Financial Aid and Office of Student Academic Success to determine initial enrollment term

4. Meet the program standards set forth by your accrediting body (if applicable) for alternative delivery modes

Program Administration

1. Submit applicable courses for online delivery and any course revisions to curriculum.osu.edu (after CAA approval of program)

2. Label students in the Student Information System with the Distance Education subplan (ONL)

    a. Please note that the Distance Education Budget Model only applies to students labeled with the ONL subplan

3. Collaborate with Admissions to create an application

4. Develop and maintain a website or webpage for the program that links to the application

5. Incur additional costs not covered by the Distance Education Budget Model, if applicable, associated with distance education programming (e.g. staff or funding to provide consistent support and services to students, faculty, and staff associated with online programs as provided to those for on-ground programs)

6. Collaborate with the Digital Learning and Student Success marketing team

    a. Work in tandem with Digital Learning and Student Success marketing to design annual marketing plan

    b. Partner with Digital Learning and Student Success marketing to financially support agreed-upon marketing tactics as outlined in the marketing plan. To maximize the program's potential, each college must invest in its own marketing. The college must allocate the appropriate resources in order to reach each program's enrollment goals. (See College Marketing Responsibilities, attached)

    c. Regularly share application and enrollment numbers to inform marketing strategy (in the absence of a centralized customer relationship management (CRM) system)

7. Identify a Faculty/Program Director or designee to meet with OTDI on a semester basis to confirm course design schedule, faculty/instructor participation, share information such as strategies and future plans, updates and feedback regarding the program and OTDI support.

Participate in Compliance Activities

1. Collaborate with OTDI on state authorizations and state professional licensing board approvals for programs in a licensed field

    a. Identify a state authorizations liaison to serve as the connection to the state authorization team

    b. Upon request, provide program, instructor and faculty information to the state authorization team

    c. Provide required professional licensing board disclosures in writing to potential and enrolled students

    d. Communicate to prospective students regarding their eligibility to enroll in the program and seek federal financial aid based on the program's authorization status

    e. Notify OTDI of states/countries from which you would like to enroll students during initial State Authorization consultation and if changes arise

    f. Post a link to the Ohio State Online disclosures webpage (go.osu.edu/disclosures) on the program webpage maintained by the college

    g. Notify the state authorization team and the appropriate state authorization liaison regarding any changes in trigger activities outside Ohio, such as:

      i. Establishing a physical location for students to receive synchronous or asynchronous instruction

      ii. Establishing an administrative office or providing office space for staff

      iii. Conducting on-ground supervised field experiences such as clinicals, practicums, student teaching or internships

      iv. Placing more than 10 students simultaneously at a single placement site (e.g., a hospital)

      v. Requiring students to meet in person for instructional purposes more than twice per semester

      vi. Carrying out field study or research at a field station

  h. Faculty/Program Director and instructors are recommended to participate in OTDI distance education training

      i. "State Authorization 101" BuckeyeLearn course

2. Complete Appendix B of this document to add clarity to desired program state authorization direction

Partner to Build Online Courses Based on Best Practice

1. College will collaborate with OTDI on curricular and technical solutions to design online courses based on best practice, at least one semester prior to first offering term. OTDI will provide expertise as outlined in the "Partner to Build Online Courses Based on Best Practice" section of the Digital Learning and Student Success Responsibilities.

2. Provide administrative support to facilitate OTDI instructional design scheduling for each course in the program, based on the course design schedule below. To allow for adequate support staffing from OTDI, communicate changes to that schedule at least one semester before the OTDI support would begin for each course. Schedule changes or new instructors made after that window will receive OTDI support as staffing allows.

3. Collaborate with OTDI to coordinate support for the revision of courses every three years after the initial OTDI course design support term.

4. Encourage faculty/instructors to participate in professional learning opportunities, including those offered through OTDI as well as other university partners, such as the Michael V. Drake Institute for Teaching and Learning.

5. Provide updates to OTDI about course instructor changes that necessitate additional consultation support from OTDI (e.g., a new instructor beginning to teach an existing course before its three-year revision support).

6. Complete Appendix C of this document to add clarity to desired program course design direction

Conduct Marketing to Drive Applications to the Online Program

1. **Designate a Dedicated Marketing Liaison**– Designate a marketing professional in the college to support the program marketing strategy. The marketer will serve as the college's liaison to the Digital Learning and Student Success marketing team and will work with the faculty/program director and other college marketing and communications professionals to conduct marketing activities as noted in the program's annual marketing plan.

2. **Establish Marketing Budget** – Work with the Digital Learning and Student Success marketing team to establish an appropriate marketing budget to meet the program's enrollment goals.

3. **Create a Strong Web Presence** – An optimized web presence is the most critical asset for marketing the online program. Stakeholders in the college must have access to the content management system (CMS) to make necessary changes and enhancements to the program's web page(s) on the college or department's website.

4. **Participate in Promotional Activities** – Build awareness of your online program to increase brand recognition and convert prospective students into applicants. Activities for which the college must participate in include but are not limited to:

   a. Recruitment activities to nurture leads

   b. Content marketing (storytelling, social media, gated content, info sessions)

   c. Email marketing (list acquisition, awareness generation through newsletters, etc.)

   d. Partnering with OTDI, where applicable, to submit data to the *U.S. News and World Report* for Best Online Programs Rankings Survey

5. Complete Appendix A of this document to add clarity to desired program marketing direction

Provide Student Support to Online Learners

1. Collaborate with relevant student support services (Disability Services, Writing Center, Libraries, Military and Veterans Services, etc.) to ensure resources available across campus are made know to learners and that student needs are met.

2. Ensure compliance with applicable university policy expected for courses of all modalities at Ohio State, including provisions of the Digital Accessibility Policy to include obtaining approved Accommodation-Based Exceptions, when needed. College/Department will be responsible for the costs associated with these

accommodations as well as accommodations for utilized tools outside of the Ohio State supported toolset.

3. Identify student technology support for tools only used by your program or those outside of the supported university toolset (Toolset Services: teaching.resources.osu.edu/toolsets).

Major Deliverables

High level deliverables that will be provided by OTDI:

- OTDI will design courses in partnership with faculty/instructors at least one if not two semesters prior to first offering term
- OTDI will conduct all state authorization and licensing board research prior to the program application for admission opening
- OTDI will create an annual marketing plan specific to the program.

Pricing and Billing

OTDI Digital Learning and Student Success services are funded through the Distance Education Budget Model that was created by the University Senate Fiscal subcommittee to incentivize colleges to develop online programs. Beyond the OTDI services listed in this MOU, the Budget Model also supports the learning technology toolset at Ohio State such as Canvas, Zoom, Proctorio, and ExamSoft, open courses, and the ability to provide program data. The OTDI Steering Committee; Student-Athlete Advisory Committee; Council on Distance Education Libraries, and Information Technology; Council on Academic Affairs; and Council on Enrollment and Student Progress provide governance to OTDI work and services. Please review and complete all appendices and attachments. A completed Budget Worksheet is required when submitting an MOU.

Signatories begin on page 16

APPENDICES

Appendix A: Marketing and Communications

Digital Learning and Student Success marketing is the unit responsible for promoting the Ohio State Online sub-brand and its programs, but it is crucial for each college to participate in marketing activities to reach your target audiences, be competitive in the marketplace, and increase enrollments year over year.

The below are highly recommended activities for your program's success.

For this program, does your college plan to do any of the following?

	Yes/No
Leverage market research to inform program design?	**Completed**
Consider and partner with Ohio State's Corporate Engagement Office to identify corporate partnership opportunities? (Note: OTDI can provide an introduction) (e.g. Third-Party Contract Courses)	**Possibly** **(align w/ MPH-BIO JobsOhio initiative)**
Conduct paid advertising specific to this online program?	**Yes, planned marketing and related recruitment**
Leverage a customer relationship management (CRM) system to track and nurture prospective Ohio State Online students?	**CPH Office of Academic Programs & Student Services**
Engage in virtual programming for prospective students?	**Yes**

Appendix B: State Authorization

	Yes/No
Does this program potentially lead to a professional license or certification?	**No**
Will this program be marketed as leading to a professional license or certification?	**No**
Is professional licensure or certification a prerequisite for enrollment in the program?	**No**

For this program, does your college plan to do any of the following outside of Ohio:

	Yes/No
Enroll students located outside Ohio?	**Yes, possibly**
Establish a physical location for students to receive synchronous or asynchronous instruction?	**No**
Establish an administrative office or provide office space outside of Ohio for staff?	**No**
Conduct on-ground supervised field experiences such as clinicals, practicums, student teaching or internships?	**No**
Place more than 10 students simultaneously at a single placement site (e.g., a hospital)?	**No**
Require students to meet in person for instructional purposes more than twice per semester?	**No**
Carry out field study or research at a field station?	**No**

Appendix C: Course Design Schedule

In order for OTDI to plan appropriately and provide every instructor with the highest quality support possible, we request specific information regarding courses that comprise a program's curriculum. This information is outlined in the table below, with required columns denoted with an asterisk. The course design schedule will be confirmed with the Faculty/Program Director each semester.

Note: the information in the first row of the table is included only to provide an example of how the information should be formatted.

Course Code and Name*	Current Delivery Mode(s)* (how course has been offered previously: in person, hybrid, distance learning, N/A - new course)	Instructor (first name, lastname. number)	Anticipated Course Design Term* (OTDI course design support for instructor; one semester or more ahead of first offering)	First Offering Term* (when class is first offered online as part of this online program)
PUBHBIO 6250 Regression Methods for the Health Sciences	In person (Online synchronous during COVID)	Koch, Brandon	SP 2024	AU 2024
PUBHBIO 6270 Introduction to SAS for Public Health Students	In person	Odei, James	SP 2023	AU 2023

THE OHIO STATE UNIVERSITY

Appendix D: Attachments

Reference Attachment: **Digital Learning and Student Success Marketing – Scope of Work**

Reference Attachment: **Effective Practices for Online Teaching**

Reference Attachment: **Partnership and Roles**

Signatories

By signing this MOU, all groups agree to be active partners and to abide by this agreement:

kellie Archer
Program Director Kellie Archer, PhD

Date 01/04/2023

kellie Archer
Department Chair Kellie Archer, PhD

Date 01/04/2023

Andrea N Garringer
College Fiscal Officer Andrea Garringer, MBA

Date 01/05/2023

Michael Salvatore Bisesi
Vice Dean Michael S. Bisesi, PhD

Date 01/06/2023

Robert Peter Griffiths
Chief Digital Learning Officer

Date 01/20/2023

Aram Dobalian
Associate Dean for Graduate Studies

01/05/2023

THE OHIO STATE UNIVERSITY

DocuSign

Certificate Of Completion

Envelope Id: 0D9EDE813CC24ABE9A242F1655255A47
Subject: Complete with DocuSign: OTDI DE MOU_CPH_BIOSTATISTICS GRAD CERT+MINOR DL (ver1_12-20-22).docx
Source Envelope:

Document Pages: 16	Signatures: 6	Envelope Originator:
Certificate Pages: 2	Initials: 0	Samantha Emyle Hicks
AutoNav: Enabled		1050 Carmack Rd
EnvelopeId Stamping: Enabled		Columbus, OH 43210
Time Zone: (UTC-05:00) Eastern Time (US & Canada)		hicks.598@osu.edu
		IP Address: 74.128.202.248

Record Tracking

Status: Original	Holder: Samantha Emyle Hicks	Location: DocuSign
1/4/2023 2:25:30 PM	hicks.598@osu.edu	

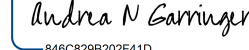| Signer Events	Signature	Timestamp
Kellie Archer archer.43@osu.edu Professor and Chair The Ohio State University Security Level: Email, Account Authentication (None)	DocuSigned by: *kellie Archer* D82623E00E6D499... Signature Adoption: Pre-selected Style Using IP Address: 164.107.214.145	Sent: 1/4/2023 2:31:05 PM Viewed: 1/4/2023 2:43:20 PM Signed: 1/4/2023 2:43:35 PM
Electronic Record and Signature Disclosure: Not Offered via DocuSign		
Andrea N Garringer garringer.11@osu.edu Director of Administration The Ohio State University Security Level: Email, Account Authentication (None)	DocuSigned by: *Andrea N Garringer* 846C829B202F41D... Signature Adoption: Pre-selected Style Using IP Address: 128.146.179.111	Sent: 1/4/2023 2:43:37 PM Viewed: 1/5/2023 4:00:36 PM Signed: 1/5/2023 4:01:25 PM
Electronic Record and Signature Disclosure: Not Offered via DocuSign		
Aram Dobalian dobalian.1@osu.edu Associate Dean for Graduate Studies Security Level: Email, Account Authentication (None)	DocuSigned by: *Aram Dobalian* 97E30715D63047E... Signature Adoption: Pre-selected Style Using IP Address: 104.57.9.254	Sent: 1/5/2023 4:01:28 PM Viewed: 1/5/2023 4:18:22 PM Signed: 1/5/2023 4:18:26 PM
Electronic Record and Signature Disclosure: Not Offered via DocuSign		
Michael Salvatore Bisesi bisesi.12@osu.edu The Ohio State University Security Level: Email, Account Authentication (None)	DocuSigned by: *Michael Salvatore Bisesi* 226658F25B0F45E... Signature Adoption: Pre-selected Style Using IP Address: 164.107.214.43	Sent: 1/5/2023 4:18:29 PM Viewed: 1/6/2023 9:22:38 AM Signed: 1/6/2023 9:22:58 AM
Electronic Record and Signature Disclosure: Not Offered via DocuSign		
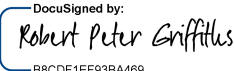
Signer Events	Signature	Timestamp
Robert Peter Griffiths griffiths.44@osu.edu The Ohio State University Security Level: Email, Account Authentication (None), Login with SSO	DocuSigned by: *Robert Peter Griffiths* B8CDF1EF93BA469... Signature Adoption: Pre-selected Style Using IP Address: 65.185.56.19	Sent: 1/6/2023 9:23:00 AM Viewed: 1/6/2023 9:56:51 AM Signed: 1/20/2023 3:52:02 PM

Electronic Record and Signature Disclosure:
    Not Offered via DocuSign

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp
Samantha Emyle Hicks hicks.598@osu.edu Division Coordinator, Division of Biostatistics, College of Public Health The Ohio State University Security Level: Email, Account Authentication (None)	**COPIED**	Sent: 1/20/2023 3:52:05 PM Resent: 1/20/2023 3:52:08 PM Viewed: 1/23/2023 9:20:43 AM

Electronic Record and Signature Disclosure:
    Not Offered via DocuSign

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	1/4/2023 2:31:05 PM
Certified Delivered	Security Checked	1/6/2023 9:56:51 AM
Signing Complete	Security Checked	1/20/2023 3:52:02 PM
Completed	Security Checked	1/20/2023 3:52:05 PM

Payment Events	Status	Timestamps

Curriculum Proposal Checklist

THE OHIO STATE UNIVERSITY

Title of Program: Biostatistics Graduate Certificate

Effective term: Autumn   2023   **College:** Public Health

New/Establish: ✓   **Secondary Major Eligible:** ☐   **Academic Unit:** Public Health

Revise: ☐   **50% Revision:** ☐   **Mark Up:** ☐   **Program Contact:** Michael S Bisesi

Terminate: ☐   **Suspend:** ☐   **Certificate Category*:** 3a - Graduate, Post-Bachelor Degre

Degree/Credential: Certificate

Program of Study : Certificate   **Title:** Biostatistics Graduate Certificate

Code: GPHB-CRT

Program Focus*:

Credit hours to degree/credential: 14   **Is this a change to the current total?** ☐ **Yes** ☐ **No**

Program offered only online? ✓ **Yes** ☐ **No**   **If yes, is there a signed MOU with ODEE?** ☐ **Yes** ✓ **No**

Campus(es) where offered: ✓ **Columbus** ☐ **ATI** ☐ **Lima** ☐ **Mansfield** ☐ **Marion** ☐ **Newark**

Rationale: The Division of Biostatistics at the College of Public Health is proposing a 14 credit graduate-level certificate in Biostatistics. In a preliminary market scan of degree programs and jobs in biostatistics and data science, biostatistics was the top "hard skill" required in 2,541 unique job postings for management analysts, medical scientists, statisticians, and epidemiologists in Ohio, Indiana, Kentucky, Michigan, Pennsylvania, and West Virginia between August 2020 and August 2021 . Data analysis was fourth, epidemiology was fifth, and statistics was sixth. Therefore, this Graduate Certificate in Biostatistics was designed to equip learners with the background in epidemiologic study design, biostatistics, and statistical computing required for public health data analysis in the public and private sectors. Completion of the program will enhance the learner's credentials to existing or prospective employers by providing evidence of knowledge and skills that can contribute to applied biostatistical analyses.

Student Curriculum Sheet Required: ✓

Four Year (or appropriate) Plan: ✓

Academic Unit Curriculum Committee approval date: 12/8/22

College Curriculum Committee approval date: 12/8/22

Graduate School Council approval date*:

Regional Campus approval date*:

Council on Academic Affairs approval date:

University Senate approval date*:

Board of Trustees approval date*:

ODHE approval date*:

* If applicable

Curriculum Proposal Checklist

THE OHIO STATE UNIVERSITY

Title of Program:

Effective term: **College:**

New/Establish: **Secondary Major Eligible:**   **Academic Unit:**

Revise: **50% Revision:**   **Mark Up:**   **Program Contact:**

Terminate: **Suspend:**   **Certificate Category*:**

Degree/Credential:

Program of Study :   **Title:**

Code:

Program Focus*:

Credit hours to degree/credential: **Is this a change to the current total?**   **Yes**   **No**

Program offered only online?   **Yes**   **No** **If yes, is there a signed MOU with ODEE?**   **Yes**   **No**

Campus(es) where offered: Columbus   ATI   Lima   Mansfield   Marion   Newark

Rationale:

Student Curriculum Sheet Required:

Four Year (or appropriate) Plan:

Academic Unit Curriculum Committee approval date:

College Curriculum Committee approval date:

Graduate School Council approval date*:

Regional Campus approval date*:

Council on Academic Affairs approval date:

University Senate approval date*:

Board of Trustees approval date*:

ODHE approval date*:

* If applicable