Reed, Katie

From: Smith, Randy
Sent: Friday, June 23, 2023 3:53 PM
To: Andridge, Rebecca
Cc: Reed, Katie; Smith, Randy; Miriti, Maria; Orr, James; Duffy, Lisa; Droesch, Kynthia; Bisesi, Michael; Fairchild, Amy L.
Subject: Proposal to revise the Master of Science in Public Health with a specialization in Biostatistics

Rebecca:

The proposal from the College of Public Health to revise the Master of Science in Public Health with a specialization in Biostatistics was approved by the Council on Academic Affairs at its meeting on June 23, 2023. Thank you for attending the meeting to respond to questions/comments.

No additional level of internal 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 work you with 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.

Randy

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

From:	Carpenter, TJ
To:	Reed, Katie
Cc:	Miriti, Maria; Droesch, Kynthia; Bisesi, Michael
Subject:	Proposal to revise the Master of Science in Public Health with a specialization in Biostatistics
Date:	Monday, May 15, 2023 11:25:45 AM
Attachments:	image001.png Master of Science in Public Health_Specialization in Biostatistics program change proposal.pdf

Katie,

Please find a proposal to revise the Master of Science in Public Health with a specialization in Biostatistics. It has been reviewed and approved by Graduate Council.

Please let me know if you need additional information to add this proposal to the agenda of the upcoming CAA meeting.

THE OHIO STATE UNIVERSITY
GRADUATE SCHOOL

TJ Carpenter, MS
Administrative Coordinator
The Ohio State University
Graduate School
250H University Hall, 230 North Oval Mall, Columbus, OH 43210
614-688-0230 Office
carpenter.1112@osu.edu / www.gradsch.osu.edu
Pronouns: He/Him/His

TO: Randy Smith, Vice Provost for Academic Programs

FROM: Graduate School Curriculum Services

DATE: April 15, 2023

RE: Proposal to revise the Master of Science in Public Health with a specialization in Biostatistics

Proposal to revise the Master of Science in Public Health with a specialization in Biostatistics

The proposal was received by the Graduate School on November 29, 2023. The combined GS/CAA subcommittee first reviewed the proposal on April 24, 2023, and recommended it for approval by the Graduate Council. The proposal was approved by the Graduate Council on May 9, 2023.

Ohio State University College of Public Health

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

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

FROM: Michael S. Bisesi, PhD
Vice Dean of Academic Affairs and Academic Administration
College of Public Health
Bisesi.12@osu.edu

DATE: November 29, 2022

RE: Curriculum Revision for Master of Science Degree with a specialization in Biostatistics- College of Public Health

Please accept this notice of revision to the Master of Science (MS) curriculum for the Biostatistics specialization (PUBHLTB-MS) offered by the College of Public Health. The Academic Studies Governance Committee in the College of Public Health approved this revision 11/20/22.

The change is a result of some minor curriculum revisions, however no current learning goals/ objectives and/or the assessment plan, nor total credits required will change for the degree.

The modifications include:

- Requiring all students to take the course, PUBHBIO 6260: Ethics in Biostatistics (1 credit)
- Reducing the total number of elective credits required from 13 to 12 credits

The Division of Biostatistics developed the existing PUBHBIO 6260: Ethics in Biostatistics course because although there are some “responsible conduct of research” courses offered at Ohio State, none of them specifically addressed or focused on the specific issues affecting analysts/statisticians. This course examines ethical challenges related to research design, data collection, data integrity and stewardship, data analysis and interpretation, data reporting, challenges in measuring people: gender, race, and other sensitive topics, and considerations when including race in multivariable models. Through presentation of historical and current case studies this course covers ethical concerns commonly faced by analysts/statisticians and provide tools to address future quandaries. This curriculum change is to ensure all students complete this important educational component by making PUBHBIO 6260 a required course.

The goal is to implement the revised curriculum effective Autumn 2023. The proposed curricular change will have no adverse impact to current PUBHLTB-MS students relative to increased credits, costs, or time-to-degree. Current PUBHLTB-MS students (n=7) are able to access the curriculum guide from the time of entry on the College of Public Health website and are aware that their degree requirements differ from PUBHLTB-MS students entering the program in Autumn 2023. Attached you will find a current curriculum guide, a redlined curriculum guide, a proposed curriculum guide and the syllabus for the added course (which has already been approved by the Council on Academic Affairs).

If feasible, we would appreciate an expedited review and approval.

Thank you very much.

Effective Summer 2022

THE OHIO STATE UNIVERSITY
COLLEGE OF PUBLIC HEALTH

2022-2023 Curriculum Guide for Master of Science degree program with a specialization in BIOSTATISTICS

The Master of Science (MS) degree is intended for students whose interests in biostatistics are academically oriented rather than directed toward professional practice. MS graduates will have the knowledge and skills to participate in basic and applied research and will have the foundation to enter into a research-oriented career. The MS degree may also serve as an entry point for students who are qualified to pursue a PhD degree which requires broader scope and depth of content via additional didactic courses and more intensive research emphasis. The MS degree requires preparation and defense of a thesis on Biostatistical methods/applications. The MS degree typically can be completed within two years.

Students admitted to the MS degree program are assigned a faculty advisor who will provide guidance throughout the program. This document serves as a resource to be used by the student and the advisor in planning a program with a specialization in Biostatistics, but is not inclusive of all important degree, college, and university requirements. All students are expected to be familiar with the College of Public Health (CPH) *Graduate Student Handbook*: http://cph.osu.edu/students/graduate/handbooks , the *Graduate School Handbook* http://www.gradsch.ohio-state.edu/ and the CPH competencies: https://go.osu.edu/cphcompetencies.

PROGRAM OF STUDY

The MS Biostatistics curriculum consists of a minimum of 45 credits.

Required Foundation Courses (9 credits)

PUBHLTH 6010	Essentials of Public Health	3 credits
PUBHBIO 6210	Applied Biostatistics I	3 credits
PUBHEPI 6410	Principles of Epidemiology	3 credits

Required Specialization Courses (17 credits)

PUBHBIO 6211	Applied Biostatistics II	3 credits
PUBHBIO 6270	Introduction to SAS for Public Health Students	2 credits
PUBHBIO 7245/STAT 7755	Biostatistical Collaboration	2 credits
STAT 6301	Probability for Statistical Inference	3 credits
STAT 6302	Theory of Statistical Analysis	3 credits
STAT 6450	Applied Regression Analysis	4 credits

Electives (13 credits)

Choose a minimum of 13 credits from this list, or other courses approved by the advisor.

PUBHBIO 5280	Introduction to Genomic Data Analysis	3 credits
PUBHBIO 7215	Design and Analysis of Clinical Trials	2 credits
PUBHBIO 7220	Applied Logistic Regression	3 credits
PUBHBIO 7225/STAT 6510	Survey Sampling Methods	3 credits
PUBHBIO 7230	Applied Longitudinal Analysis	3 credits
PUBHBIO 7235/STAT 6605	Applied Survival Analysis	3 credits
PUBHBIO 7240/STAT 6520	Applied Statistical Analysis with Missing Data	3 credits
PUBHBIO 7255	Introduction to Causal Inference	3 credits
PUBHBIO 8450	Stochastic Epidemic Models	3 credits
STAT 6625	Statistical Analysis of Genetic Data	3 credits
STAT 6730	Introduction to Computational Statistics	2 credits

Thesis (6 credits)

PUBHLTH 7999	Thesis Research in Public Health	6 credits

Sample Curriculum Plan for the Master of Science in Biostatistics

(THIS IS ONE OPTION, STUDENTS ARE ADVISED TO CONSULT WITH THEIR ADVISOR FOR OTHER OPTIONS)

Year 1 Autumn	PUBHBIO 6210	Applied Biostatistics I	3 credits
	PUBHBIO 6270	Introduction to SAS for Public Health Students	2 credits
	STAT 6301	Probability for Statistical Inference	3 credits
	PUBHEPI 6410	Principles of Epidemiology	3 credits
Year 1 Spring	PUBHBIO 6211	Applied Biostatistics II	3 credits
	STAT 6450	Applied Regression Analysis	4 credits
	STAT 6302	Theory of Statistical Analysis	3 credits
	PUBHLTH 6010	Essentials of Public Health	3 credits
Year 2 Autumn	PUBHLTH 7999	Thesis Research in Public Health	3 credits
	Elective		3 credits
	Elective		3 credits
	Elective		3 credits
Year 2 Spring	PUBHLTH 7999	Thesis Research in Public Health	3 credits
	PUBHBIO 7245/STAT 7755	Biostatistical Collaboration	2 credits
	Elective		3 credits
	Elective		1 credit

Grade Policy:

In addition to the general Graduate School requirements of a cumulative grade point average of 3.0 or higher, students must meet specific college policies regarding grades in Foundation and specialization courses. Students should familiarize themselves with Section 11 of the College of Public Health Graduate Student Handbook.

College of Public Health - Office of Academic Programs and Student Services (OAPSS)

OAPSS staff are available to provide assistance with College, Graduate School and University policies and procedures. (614) 292-8350/100 Cunz Hall/1841 Neil Ave/Columbus, Ohio/ 43210/cph.osu.edu

********Questions regarding the student's program of study should be directed to their advisor********

Effective Summer ~~2022~~2023

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COLLEGE OF PUBLIC HEALTH

~~2022~~2023-~~2023~~ 2024 Curriculum Guide for Master of Science degree program with a specialization in BIOSTATISTICS

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Required Specialization Courses (~~17~~ 18 credits)

PUBHBIO 6211	Applied Biostatistics II	3 credits
PUBHBIO 6260	Ethics in Biostatistics	1 credit
PUBHBIO 6270	Introduction to SAS for Public Health Students	2 credits
PUBHBIO 7245/STAT 7755	Biostatistical Collaboration	2 credits
STAT 6301	Probability for Statistical Inference	3 credits
STAT 6302	Theory of Statistical Analysis	3 credits
STAT 6450	Applied Regression Analysis	4 credits

Electives (~~13~~ 12 credits)

Choose a minimum of ~~13~~ 12 credits from this list, or other courses approved by the advisor.

PUBHBIO 5280	Introduction to Genomic Data Analysis	3 credits
PUBHBIO 7215	Design and Analysis of Clinical Trials	2 credits
PUBHBIO 7220	Applied Logistic Regression	3 credits
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	PUBHBIO 7245/STAT 7755	Biostatistical Collaboration	2 credits
	Elective		3 credits

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********Questions regarding the student's program of study should be directed to their advisor********

THE OHIO STATE UNIVERSITY
COLLEGE OF PUBLIC HEALTH

PUBHBIO 6260– Ethics in Biostatistics
1 credit hour – Autumn 2021

Instructors: Dr. Rebecca Andridge and Dr. Abigail Shoben
242 Cunz Hall 249 Cunz Hall
614-247-7912 614-247-8092
andridge.1@osu.edu shoben.1@osu.edu

Class Time and Location: TBD (in-person)

Instructor's Office Hours: TBD

Course description: The course examines ethical challenges related to research design, data collection, data integrity and stewardship, data analysis and interpretation, and data reporting in the conduct of public health and biomedical research. Through presentation of historical and current case studies we discuss ethical concerns commonly faced by biostatisticians and provide tools to address future quandaries.

Prerequisites: Enrollment in MPH-Biostatistics specialization, or MS-Biostatistics specialization, or Interdisciplinary PhD in Biostatistics, or permission of instructor

Class Format: Weekly in-person discussion-based class meetings. Students will complete weekly readings and complete a short reflection paper/journal entry each week (with prompt provided by instructors). Instructors will lead weekly discussions of the readings. Some weeks will consist of in-depth discussion of hypothetical case studies of ethical issues in medicine/public health that students may encounter.

Course Learning Objectives:

1. Identify potential ethical concerns in situations commonly confronting biostatisticians.
2. Explain how current and historical events affect current ethical issues for biostatisticians.
3. Analyze the potential impact of research on different communities from an ethical perspective.

Core Competencies:

Foundational Public Health Knowledge:

3. Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health
6. Explain the critical importance of evidence in advancing public health knowledge

Foundational MPH Competencies:

20. Describe the importance of cultural competence in communicating public health content

A complete list of College of Public Health Competencies are located in Appendix C of the CPH Graduate Student Handbook that can be found at: https://go.osu.edu/cphgradcompetencies

Text/Readings: Readings will come from the peer-reviewed literature, news sources, blog posts, and other sources. See the course schedule for details.

Grading: This course is letter graded. Final class grade will be determined as follows:

Participation	20%
Weekly Reflection Papers	60%
Final Paper	20%

This course will use the standard OSU grading scheme:

A	93-100	B+	87-89.9	C+	77-79.9	D+	67-69.9	E	0-59
A-	90-92.9	B	83-86.9	C	73-76.9	D	60.66.9		
		B-	80-82.9	C-	70-72.9				

Exams: There are no exams in this course.

Assignments:

Class Participation:
Students are expected to come to class prepared by having completed the week's reading and reflection paper. In class, students are expected to engage with and discuss the week's material. Students are encouraged to:

- actively ask questions of the instructor and classmates;
- share their perspective;
- challenge the ideas discussed in class.

The classroom will be a safe place for students to engage in discussion. All dialogue is expected to be collegial and open. If classroom discussion happens to elicit differences in opinion, these differing views will *focus on the issue or problem*, *rather than on the person* challenging us to consider different views.
Grading Criteria: Grades will be based on contributions such as the following: sharing ideas and raising points during class discussions, asking questions, participating in individual and group in-class activities, and paying attention actively in class. Students who are active participants are actively engaged in their learning. Active learners are willing to share and learn from others, contribute to the learning of their classmates, and try to apply what they are learning to their life outside of the class. The specific grading rubric for class participation will be provided on Carmen.

Weekly Reflection Paper:
Each week a writing prompt related to that week's readings or case study will be provided on Carmen. Students should write a response that is approximately 400-500 words (roughly 4-5 paragraphs) in length that is informed by the readings and personal perspective. **The purpose of the assignment is to encourage critical thinking and reflection on the weekly topic, which will provide a "warm-up" for the course session each week.** Reflections should be completed individually (without collaboration with other students). However, students are permitted and encouraged to share thoughts articulated in the reflection during in-class discussions.
Grading Criteria: Grades will be based on (a) relevance to the question/topic, (b) depth and diligence of critical thinking, (c) writing clarity, and (d) timeliness. Submissions of reflection papers after class discussion will be docked one level on the rubric and accepted up to one week following the discussion. Papers not submitted within a week will receive a zero. The specific grading rubric for reflection papers will be provided on Carmen.

Final Paper:
The final assignment will be a culminating paper reflecting on the student's learning in the course. Students will consider the *5 most important things* that they have learned in the course and explain (a) what each point or lesson is, and (b) why it is important, including specifically commenting on why or how it will be useful to them in their career. The 5 points may be anything at all from the course, however, one point must include something you learned about yourself. The key aspects of this assignment are that the student explains each item clearly and convincingly describes why each item was selected. The length should be approximately 1200-1500 words. Final papers must be written independently (without collaboration with other students).
Grading Criteria: Grades will be based on (a) depth and diligence of critical thinking, (b) demonstration of learning from the course (i.e., sophistication of reasoning about course topics), and (c) writing clarity. The specific grading rubric for the final paper will be provided on Carmen.

Carmen: There is a Carmen site for this course (https://carmen.osu.edu). All readings and assignments will be distributed via Carmen, and submission of all assignments will be done via Carmen.

Class Policies: This course is primarily discussion based. As such, it is expected that all students will regularly attend class and participate fully. Students expecting more than sporadic absence (>2 class days) should discuss their situation with the instructor as soon as possible. For specific policies on collaboration on assessments, please see the descriptions of individual assignments.

Health and Safety Requirements
All students, faculty and staff are required to comply with and stay up to date on all university safety and health guidance (https://safeandhealthy.osu.edu), which includes following university mask policies and maintaining a safe physical distance at all times. Non-compliance will be warned first and disciplinary actions will be taken for repeated offenses.

Office of Student Life: Disability Services
Any student who feels s/he may need an accommodation based on the impact of a disability should contact the instructors privately to discuss your specific needs. Please contact the Office of Student Life: Disability Services at 614-292-3307 in Room 098 Baker Hall 113 W. 12th Ave. to coordinate reasonable accommodations for students with documented disabilities (http://slds.osu.edu/).
[COVID-SPECIFIC INFO TO BE ADDED IF STILL RELEVANT IN AUTUMN 2021]

Mental Health Services
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting https://ccs.osu.edu/ or calling 614-292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org.

Academic integrity

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University, the College of Public Health, and the Committee on Academic Misconduct (COAM) expect that all students have read and understood the University's *Code of Student Conduct* and the School's *Student Handbook*, and that all students will complete all academic and scholarly assignments with fairness and honesty. The *Code of Student Conduct* and other information on academic integrity and academic misconduct can be found at the COAM web pages (https://oaa.osu.edu/academic-integrity-and-misconduct). Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct*, the *Student Handbook*, and in the syllabi for their courses may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Please note that the use of material from the Internet without appropriate acknowledgement and complete citation is plagiarism just as it would be if the source were printed material. Further examples are found in the *Student Handbook*. Ignorance of the *Code of Student Conduct* and the *Student Handbook* is never considered an "excuse" for academic misconduct.

If I suspect a student of academic misconduct in a course, I am obligated by University Rules to report these suspicions to the University's Committee on Academic Misconduct. If COAM determines that the student has violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in the course and suspension or dismissal from the University. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Course Outline

Week	Date	Readings & Topics
1		**Course Introduction**
2		**Principles of Ethics in Statistics** • American Statistical Association. Ethical Guidelines for Statistical Practice https://www.amstat.org/ASA/Your-Career/Ethical-Guidelines-for-Statistical-Practice.aspx • Hurwitz S, Gardenier JS. (2012) Ethical guidelines for statistical practice: The first 60 years and beyond. *The American Statistician,* 66, 99-103.
3		**Research Misconduct and Conflicts of Interest** • Excerpts from https://ori.hhs.gov/ori-introduction-responsible-conduct-research
4		**Ethical Issues in Study Design** • Grady C (2015). Enduring and emerging challenges of informed consent. *New England Journal of Medicine*, 372(9), 855-62. doi: https://doi.org/10.1056/nejmra1411250 • Damery, S., Ryan, R., McManus, R.J., Warmington, S., Draper, H., Wilson, S. and (2011), The effect of seeking consent on the representativeness of patient cohorts: iron-deficiency anaemia and colorectal cancer. Colorectal Disease, 13: e366-e373. https://doi.org/10.1111/j.1463-1318.2011.02724.x • Saxman, S.B. (2015), Ethical Considerations for Outcome-Adaptive Trial Designs. Bioethics, 29: 59-65. https://doi.org/10.1111/bioe.12084
5		**Ethical Issues in Data Analysis** • Young SS, Karr A (2011) Deming, data and observational studies: A process out of control and needing fixing. *Significance,* 116-120. https://doi.org/10.1111/j.1740-9713.2011.00506.x • Gelfond JA, Heitman E, Pollock BH, Klugman CM (2011). Principles for the ethical analysis of clinical and translational research. *Statistics in Medicine*, 30, 2785-2792. https://dx.doi.org/10.1002/sim.4282 • MacCoun R, Perlmutter S (2015). Blind Analysis: Hide results to seek the truth. *Nature,* 526, 187-189. https://www.nature.com/news/blind-analysis-hide-results-to-seek-the-truth-1.18510
6		**Case Study 1:** "Just one more thing" • Reading: Case study background and summary

Week	Date	Readings & Topics
7		**Data Integrity and Stewardship** • The Editors of the Lancet Group: Learning from a retraction https://doi.org/10.1016/S0140-6736(20)31958-9 • Meyer MN (2018). Practical tips for ethical data sharing. *Advances in Methods and Practices in Psychological Science*, 1(1), 131-144. https://doi.org/10.1177/2515245917747656 • Levenstein MC, Lyle JA (2018). Data: Sharing Is Caring. *Advances in Methods and Practices in Psychological Science*, 1(1), 95-103. https://doi.org/10.1177/2515245918758319 • Gelman A (2011). Ethics and Statistics: Open Data and Open Methods. *Chance*, 51-53. https://doi.org/10.1080/09332480.2011.10739888 • Reading TBD about reproducibility
8-9		**Challenges in Measuring People: Gender, Race, and Other Sensitive Topics (2 weeks)** • U.S. Census 2020 Questions on Sex and Race https://2020census.gov/en/about-questions.html and https://2020census.gov/en/about-questions/2020-census-questions-race.html • Clayton JA (2018). Applying the new SABV (sex as a biological variable) policy to research and clinical care. *Physiology & Behavior*, 187, 2-5.https://doi.org/10.1016/j.physbeh.2017.08.012 • Oldehinkel AJ (2017). Editorial: Let's talk about sex – the gender binary revisited. *The Journal of Child Psychology and Psychiatry*, 58, 836-864. https://doi.org/10.1111/jcpp.12777 • Magliozzi D, Saperstein A, Westbrook L (2016). Scaling Up: Representing Gender Diversity in Survey Research. *Socius*, https://doi.org/10.1177/2378023116664352 • Chapter 10, "Measurement of Race by the U.S. Government" in https://www.nap.edu/read/10887/chapter/15
10		**Case Study 2:** "Student survey consultation" • Reading: Case study background and summary
11-12		**Considerations When Including Race in Multivariable Models (2 weeks)** • Robinson WR, Renson A, Naimi AI (2020). Teaching yourself about structural racism will improve your machine learning. *Biostatistics*. 21; 339-344. https://academic.oup.com/biostatistics/article/21/2/339/5631851 • Why Racism, Not Race, Is a Risk Factor for Dying of COVID-19. An interview with Dr. Camara Phyllis Jones. *Scientific American*, June 12, 2020. https://www.scientificamerican.com/article/why-racism-not-race-is-a-risk-factor-for-dying-of-covid-191/ • Is It Time For A Race Reckoning In Kidney Medicine? NPR blog post, Dec. 28, 2020 https://www.npr.org/sections/health-shots/2020/12/28/949408943/is-it-time-for-a-race-reckoning-in-kidney-medicine

Week	Date	Readings & Topics
13		**Considerations when Communicating Results** • Readings TBD
14		**Case Study 3:** "Risk factors for preterm birth" • Reading: Case study background and summary

Degree Program Competencies with Aligned Assessments

	Class Participation/ Discussion	Weekly Reflection Papers	Final Paper
Foundational Public Health Knowledge			
3. Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health	x	x	x
6. Explain the critical importance of evidence in advancing public health knowledge	x	x	x
Foundational MPH Competencies			
20. Describe the importance of cultural competence in communicating public health content	x	x	