From:	Smith, Randy
To:	Hobbs, Stuart (OSUMC)
Cc:	Sutherland, Sue; Greenbaum, Rob; Reed, Katie; Smith, Randy; Miriti, Maria; Duffy, Lisa; Hunt, Ryan; Johnson, Julie (OSUMC); Wang, Henry (OSUMC); Clinchot, Dan (OSUMC)
Subject:	Proposal to revise the Biomedical, Clinical, and Translational Science Interdisciplinary Specialization
Date:	Sunday, November 24, 2024 12:11:41 PM
Attachments:	image001.png

Stuart:

The proposal from the Clinical and Translational Science Institute to revise the Biomedical, Clinical, and Translational Science Interdisciplinary Specialization was approved by the Council on Academic Affairs at its meeting on November 20, 2024. Thank you for attending the meeting to respond to questions/comments.

No additional level of internal review/approval is necessary. This action will be included in the Council's next Annual Activities Report to the University Senate (July 2025).

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 the Chair of the Council, Professor Sue Sutherland (.43), or me.

I wish you success with this important program development.

Randy

THE OHIO STATE UNIVERSITY

W. Randy Smith, Ph.D.
Vice Provost for Academic Programs
Office of Academic Affairs
University Square South, 15 E. 15th Avenue, Columbus, OH 43201
614-292-5881 Office
smith.70@osu.edu
Assisted by:
Katie Reed
Executive Assistant
(614) 292-5672

TO: Randy Smith, Vice Provost for Academic Programs

FROM: Graduate School Curriculum Services

DATE: **10/24/2024**

RE: Proposal to **Revise the Biomedical, Clinical and Translational Science IS in the College of Medicine**

The **Clinical and Translational Science Institute** in the **College of Medicine** is proposing a **Revision to the Biomedical, Clinical and Translational Science Interdisciplinary Specialization**.

The proposal was received by the Graduate School on **9/09/2024**. The combined GS/CAA subcommittee first reviewed the proposal on **10/24/2024** and support forwarding to CAA for review.

THE OHIO STATE UNIVERSITY
CLINICAL AND TRANSLATIONAL SCIENCE INSTITUTE

Clinical and Translational Science Institute

Prior Hall, Suite 260
376 W 110th Ave.
Columbus, OH 43210

614-123-4567 Phone
614-123-4567 Mobile
614-123-4567 Fax

ctsi.osu.edu

August 15, 2024

W. Randy Smith, PhD
Vice Provost for Academic Programs
Office of Academic Affairs
University Square South, Ste. 4112
15 E. 15th Street
Columbus, OH 43201

Dear Dr. Smith:

The Clinical and Translational Science Institute is the originating unit for the Biomedical, Clinical, and Translational Science Interdisciplinary Specialization. To complete this specialization, students take a core course in Clinical and Translational Science (PUBHEPI 6412: Basic Principles in Clinical and Translational Science) and then take one course from each of four thematic tracks. There are anywhere from 8 to 12 courses under each track from which to choose.

We are requesting of the Council on Academic Affairs to approve several changes to the courses from which students may choose to complete the IS:

- The removal of courses that are no longer offered at Ohio State.
- The addition of courses that offer the content of discontinued courses
- The addition of new courses that are highly important to clinical and translational science, such as Team Science. Some of these course additions also reflect the suggestions of students in the program who have found the courses valuable

Attached you will find our formal proposal, containing a narrative rationale for the changes, the current and the proposed revised curriculum, and a transition plan. In Appendix 1 you will find an advising sheet. Appendix 2 contains syllabi from all the requested new courses. In Appendix 3 you will find letters of support from: The College of Public Health: Divisions of Biostatistics and Health Behavior and Health Promotion; the College of Medicine: School of Health and Rehabilitation Sciences; Arts & Sciences: Department of Evolution, Ecology and Organismal Biology; the Office of Research; the John Glenn College of Public Affairs; and the College of Social Work.

Sincerely,

Ginny L. Bumgardner, MD, PHD, FACS
Associate Dean for Physician Scientist Education and Training
Professor of Surgery, College of Medicine
Director, Predoctoral T32 Program, OSU Clinical and Translational Science Institute

CC: Stuart D. Hobbs, PhD, MBA
Associate Director Research Education, Training, & Career Development
Clinical and Translational Science Institute

Narrative of Changes to the Biomedical, Clinical, and Translational Science Interdisciplinary Specialization

The Biomedical, Clinical, and Translational Science Interdisciplinary Specialization

The Center for Clinical and Translational Science is the originating unit for the Biomedical, Clinical, and Translational Science Interdisciplinary Specialization (BIOMCLT-IS). To complete this specialization, students take a core course in Clinical and Translational Science (PUBHEPI 6412: Basic Principles in Clinical and Translational Science) and then take one course from each of four thematic tracks: Research Methods; Analysis, Statistics, and Informatics; Community & Communication; and Leadership & Training. There are anywhere from 8 to 12 courses under each track from which to choose.

Rationale for Curriculum Changes

While the Specialization is open to all OSU graduate students, it is also a requirement for students in our NIH funded predoctoral training program. We have transitioned from our last 5-year training grant to our new grant. In this time of transition, we thought it appropriate to review the program and make certain course options were appropriate to the new T32 training grant. In addition, the last time the curriculum for this Interdisciplinary Specialization underwent extensive review was when Ohio State converted from quarters to semesters. So this also seemed a good time to review the whole curriculum and bring it up to date with the latest course offerings at Ohio State that are relevant to clinical and translational science. This timing has proven opportune, as we have found that many colleges have made further revisions to their curriculum in the years since the semester conversion resulting in the discontinuation of courses on our list and the reorganization of others.

How the Changes will Benefit Students

The proposed changes will benefit students in a number of ways. First, all of the courses listed as options will be currently offered in the Ohio State University catalog. Second, students will have choices that are all closely aligned with the skills needed by a clinical and translational researcher as currently understood. Third, the revised curriculum will be aligned with student requests, such as courses in genomic data analysis and mixed methods research.

Transition Plan

All BIOMCLT-IS course plans approved before the new curriculum takes effect will be honored. Note, however, that many of the courses being removed are no longer offered or not offered in the form presented, so there will not be students taking those courses. Other courses being removed are not ones that have typically been part of student curriculum plans. The courses that will continue from the old curriculum to the revised one are the courses that are most likely to be represented on the academic plans of students currently working on the GIS. The more likely impact of the new curriculum will be that a student currently working on the specialization will see a new course they would like to take in place of one on their plan that was and still is an option for the BIOMCLT-IS. We will be happy to work with students to revise their curriculum if they wish to take a course that is a new option for them.

Supporting Materials

Here follow supporting materials for the proposed revision:

Table 1: The Current Curriculum

Table 2: The Proposed Revised Curriculum (any course that will be offered as or Distance Learning [DL] or Distance Enhanced [DH] are so marked).

Table 3: The Courses Requested to be Removed from the Curriculum with explanation

Table 4: The Courses Requested to be Added to the Curriculum with rationale

Appendix 1: A Student Advising Sheet

Appendix 2: Syllabi for all Requested New Courses

Appendix 3: Letters of Support

Table 1. The Current BIOMCLT-IS Curriculum

All students take the core course:

PUBHEPI 6412: Basic Principles in Clinical and Translational Science (2 credits)

Then students take at least one course from each of the four Core Competencies

Research Methods	**Analysis, Statistics, and Informatics**	**Community & Communication**	**Leadership & Training**
BSGP 8050: Research Techniques & Resources (4 credits)	PUBHBIO 6280: Practical Biostatistics for Biomedical Laboratory Researchers (3 credits)	HTHRHSC 7888: Health and Rehabilitation Science Grand Rounds Intro (1 credit)	NURSING 7404: Project Management for Healthcare and Clinical Research ONLINE (3 credits)
NURSING 8780: Research Methods I (3 credits)	PUBHBIO 6210: Design & Analysis of Studies in the Health Sciences I (ONLINE available) (3 credits)	BSGP 7070: Fundamentals of Grant Writing I (4 credits)	NRSPRCT 8400: Leadership Throughout Organizations & Systems (3 credits)
NURSING 7781: Responsible Conduct of Research. ONLINE (3 credits)	PUBHBIO 6211: Design & Analysis of Studies in the Health Sciences II (3 credits)	BSGP 7080: Fundamentals of Grant Writing II (2 credits)	NRSPRCT 8401: Strategic Macrosystem Management for the Doctor of Nursing Practice (3 credits)
NURSING/PHARMACY 7782 Clinical Research Design and Methods. ONLINE (3 credits)	PUBHBIO 7245: Biostatistical Collaboration (2 credits)	Nursing 6110: Health Literacy (2 credits)	HTHRHSC 7300: Management & Leadership in Health Sciences (3 credits)
NRSPRCT 8780: Clinical Effectiveness & Translation in Clinical Science (3 credits)	PSYCH 6810: Statistical Methods in Psychology I (4 credits)	PUBHHBP 7520: Community Health Assessment (2 credits)	HTHRHSC 7350: Issues & Policy in Health Sciences (3 credits)
PUBHEPI 7412: Principles & Procedures for Human Clinical Trials (3 credits)	PSYCH 6811: Statistical Methods in Psychology II (4 credits)	PUBHHBP 7544: Fundamental Determinants of Population Health & Implications for Public Health (3 credits)	PHR 5560: Success & Leadership in Pharmacy (1.5 credits)
PUBHHBP 7532: Program Evaluation in Public Health (3 credits)	STAT 5301: Intermediate Data Analysis I (4 credits)	PUBHHBP 7558: Social Ecological Strategies in Prevention (2 credits)	PUBHHMP 7617: Health Services Leadership & Organ-izational Change (3 credits)
PUBHHBP 7534: Research Methods in Health Behavior & Health Promotion (3 credits)	STAT 5302: Intermediate Data Analysis II (3 credits)	PUBHEPI 6413: Conducting & Communicating Research in Clinical & Translational Science (2 credits)	PUBAFRS 6000: Public Policy Formulation & Implementa-tion (4 credits)
PUBHHBP 7522: Program Planning & Implementation (3 credits)	VETCLIN 8783: Experimental Design & Data Analysis in Veterinary & Comparative Medicine I (1 credit)	VISSCI 7940: Oral Presentation of Scientific Research (1-3 credits)	
PUBHHMP 8671: Health Care Outcomes Measurement (2 credits)	VETCLIN 8784: Experimental Design & Data Analysis in Veterinary & Comparative Medicine II (1 credit)	VISSCI 7970: Grantsmanship (2 credits)	
PUBHHMP 7678: Approaches to Health Services Research (3 credits)	BMI 5710: Introduction to Biomedical Informatics (3 credits)	VETCLIN 8781 Research Methods and Grantsmanship (1 credit)	
VISSCI 7960: Ethics in Biomedical Research (2 credits)	BMI 5750: Methods in Biomedical Informatics (3 credits)		
PHR 8520: Research Ethics (1 credit)	BMI 8150: Rigorous and Reproducible Design and Data Analysis (3 credits) Can be used either for Methods or Analysis		

Table 2: The Proposed Revised BIOMCLT-IS Curriculum-

All students take the core course:

PUBHEPI 6412: Basic Principles in Clinical and Translational Science (2 credits)

Then students take at least one course from each of the four Core Competencies

Research Methods	**Analysis, Statistics, and Informatics**	**Community & Communication**	**Leadership & Training**
BSGP 8050: Research Techniques & Resources (4 credits)	PUBHBIO 6210 - Applied Biostatistics I (3 credits) DL	BSGP 7070: Fundamentals of Grant Writing I (4 credits)	EEOB 5510: Interdisciplinary Team Science (3 credits)
MCR 7782: Clinical Research Design and Methods. Pharmacy & Nursing (3 credits) DL	PUBHBIO 6211 - Applied Biostatistics II (3 credits) DL	BSGP 7080: Fundamentals of Grant Writing II (2 credits)	HTHRHSC 7300: Management & Leadership in Health Sciences (3 credits)
PUBHEPI 7412: Principles & Procedures for Human Clinical Trials (3 credits)	PSYCH 6810: Statistical Methods in Psychology I (4 credits)	Nursing 6110: Health Literacy (2 credits)	HTHRHSC 7350: Issues & Policy in Health Sciences (3 credits)
PUBHHBP 7534: Research Methods in Health Behavior & Health Promotion (3 credits)	PSYCH 6811: Statistical Methods in Psychology II (4 credits)	PUBHHBP 7520: Community Health Assessment (2 credits)	MCR 7404: Project Management for Healthcare and Clinical Research (3 credits) DL
HTHRHSC 7574: Mixed Methods Approaches for Policy-Related Research (3 credits)	STAT 5301: Intermediate Data Analysis I (4 credits)	PUBHHBP 6535: Community Engagement and Collaborative Community Problem-Solving (3 credits) DL	PHR 5560: Success & Leadership in Pharmacy (1.5 credits)
SOCWORK 8406: Mixed Methods Research in Social and Health Sciences (3 credits) DE	STAT 5302: Intermediate Data Analysis II (3 credits)	PUBHEPI 6413: Conducting & Communicating Research in Clinical & Translational Science (2 credits)	PUBHHBP 6558: Policy as a Prevention Strategy (2 credits)
PUBHBIO 7215: Design and Analysis of Clinical Trials (2 credits) DL	VETCLIN 8783: Experimental Design & Data Analysis in Veterinary & Comparative Medicine I (1 credit)	VETCLIN 8781 Research Methods and Grantsmanship (1 credit)	PUBHHMP 7617: Health Services Leadership & Organ-izational Change (3 credits)
PUBHHBP 7522: Program Planning & Implementation (3 credits)	VETCLIN 8784: Experimental Design & Data Analysis in Veterinary & Comparative Medicine II (1 credit)	VISSCI 7940: Oral Presentation of Scientific Research (1-3 credits)	PUBAFRS 6000: Public Policy Formulation & Implemen-tation (4 credits) DL
PUBHHMP 8671: Health Care Outcomes Measurement (2 credits)	PUBHBIO 5280: Introduction to Genomic Data Analysis (3 credits)	VISSCI 7970: Grantsmanship (2 credits)	PUBAFRS 7572: Policy Simulation and Modeling (3 credits)
HTHRHSC 7883: Responsible Conduct of Research (3 credits)	BMI 5710: Introduction to Biomedical Informatics (3 credits) DL		
PHR 8520: Research Ethics (1 credit)	BMI 5750: Methods in Biomedical Informatics (3 credits) DL		
VISSCI 7960: Ethics in Biomedical Research (2 credits)	**Research Methods, cont.**		
	GRADSCH 8000: Responsible Conduct of Research (1 credit)		
NURSING 7781: Responsible Conduct of Research. (3 credits) DL	BMI 8150: Rigorous and Reproducible Design and Data Analysis (3 credits) Can be used either for Methods or Analysis		

Table 3: The Courses Requested to be Removed from the Curriculum - with explanation

Courses Dropped from BIOMCLT-IS	Reason
HTHRHSC 7888: Health and Rehabilitation Science Grand Rounds Intro (1 credit)	This course dates from the beginning of the GIS. It is not consistent with the other courses in the GIS curriculum and being replaced by more relevant offerings, such as HTHRHSC 7574: Mixed Methods Approaches for Policy-Related Research. Mixed methods research is an area of growing student interest.
PUBHBIO 6210: Design & Analysis of Studies in the Health Sciences I	Course with this number has new name: Applied Biostatistics 1
PUBHBIO 6211: Design & Analysis of Studies in the Health Sciences II	Course with this number has new name: Applied Biostatistics 2
PUBHBIO 6280: Practical Biostatistics for Biomedical Laboratory Researchers (3 credits)	No longer in Course Catalog. It is proposed to add PUBHBIO 7215 - Design and Analysis of Clinical Trials to replace 6280.
PUBHBIO 7245 - Biostatistical Collaboration	This course is for doctoral students in biostatistics with a focus on serving as a biostatistical consultant and is not appropriate for the GIS.
PUBHHBP 7532: Program Evaluation in Public Health	This course is not as closely aligned with training goals in clinical and translational science and is being removed to allow for additional courses that are a better fit.
PUBHHMP 7678: Approaches to Health Services Research	This course is not as closely aligned with training goals in clinical and translational science and is being removed to allow for additional courses that are a better fit.
PUBHHBP 7544: Fundamental Determinants of Population Health & Implications for Public Health (3 credits)	No longer in Course Catalog.
NRSPRCT 8400: Leadership Throughout Organizations & Systems (3 credits)	No longer in Course Catalog.
NRSPRCT 8401: Strategic Macrosystem Management for the Doctor of Nursing Practice (3 credits)	No longer in Course Catalog.
NURSING 8780: Research Methods I (3 credits)	Nursing/Pharmacy 7782 was added to the GIS curriculum a few years ago. 7782 is focused on clinical research and is more relevant to the specialization than 8780. That 7792 is offered online also adds some flexibility for students to the GIS curriculum. For that reason, this course is being dropped.

Table 4: The Courses Requested to be Added to the Curriculum with rationale

Courses Added to BIOMCLT-IS	Reason
EEOB 5510: Interdisciplinary Team Science	Add to Leadership & Team Science track to provide training in team science.
GRADSCH 8000: Responsible Conduct of Research (1 credit)	Add to Research Methods Track to provide an additional option for training in responsible conduct of research. This is a new course created by the Office of Research and the Graduate School to provide NIH appropriate RCR training in a course open to all graduate students from all colleges and programs.
HTHRHSC 7883: Responsible Conduct of Research	Add to Research Methods track to provide an additional option for training in responsible conduct of research.
HTHRHSC 7574: Mixed Methods Approaches for Policy-Related Research	Add to Research Methods track because students have asked for a mixed-methods research training option. See also SOCWORK 8406, below.
PUBAFRS 7572: Policy Simulation and Modeling	Add to the Leadership & Team Science track to provide training in an important methodology in public affairs that has applicability in other domains as well.
PUBHBIO 5280: Introduction to Genomic Data Analysis	Add to the Analysis, Statistics, and Informatics track. A genomic component is increasingly important in biomedical research.
PUBHBIO 6210 - Applied Biostatistics I	Add to the Analysis, Statistics, and Informatics track to replace a comparable course no longer offered.
PUBHBIO 6211 - Applied Biostatistics II	Add to the Analysis, Statistics, and Informatics track to replace a comparable course no longer offered.
PUBHHBP 6535: Community Engagement and Collaborative Community Problem-Solving	Add to the Community & Communication Track to provide training in Community Engagement.
PUBHBIO 7215: Design and Analysis of Clinical Trials	Add to the Research Methods track to provide clinical research training and replace a course no longer offered on this topic.
SOCWORK 8406: Mixed Methods Research in Social and Health Sciences	Add to the Research Methods Track for another option in mixed-methods research training as requested by students (see also HTHRHSCC 7574, above).

Appendix 1: A Student Advising Sheet

This document will be used by students and their advisors in conjunction with a table of the curriculum like the enclosed Table 2 and a packet of course descriptions taken from the OSU Course Catalog to choose courses and map them onto the BIOMCLT-IS requirements.

THE OHIO STATE UNIVERSITY
CENTER FOR CLINICAL AND TRANSLATIONAL SCIENCE

Advising Sheet for Biomedical, Clinical, and Translational Science Interdisciplinary Specialization

This document will enable you to identify the courses that will fulfill the thematic requirements of the BCTS-IS and meet the interdisciplinary requirements from the Graduate School for Interdisciplinary Specializations.

Courses for the BCTS-IS

Core Course	Program	Credits
PUPHEPI 6412	Public Health - epidemiology	2

Thematic Track	**Course to Fulfill**	**Program**	**Credits**
Research Methods Track			
Analysis, Stats, & Informatics Track			
Community & Communication Track			
Leadership & Training Track			

IS Guidelines from Graduate School:	**TOTAL**
10 to no more than 20 hours:	
Two or more grad programs outside home program	
9 credit hours outside home program . . .	
. . . in at least 3 courses	

Appendix 2: Syllabi for all Requested New Courses

EEOB 5510 Interdisciplinary Team Science

GRADSCH 8000: Responsible Conduct of Research

HTHRHSC 7574: Mixed Methods Approaches for Policy-Related Research

HTHRHSC 7883: Responsible Conduct of Research

PUBAFRS 7572. Policy Simulation and Modeling

PUBHBIO 5280: Introduction to Genomic Data Analysis

PUBHBIO 6210: Applied Biostatistics I

PUBHBIO 6211: Applied Biostatistics II

PUBHBIO 7215: Design and Analysis of Clinical Trials

PUBHHBP 6535: Community Engagement and Collaborative Community Problem-Solving

SOCWORK 8406: Mixed Methods Research in Social and Health Sciences

SYLLABUS: EEOB 5510 INTERDISCIPLINARY TEAM SCIENCE AUTUMN SEMESTER

Course overview

Instructors

Name	email	phone	office hours	office
Alison Bennett	bennett.1242@osu.edu	614-292-6403	by appointment	386 Aronoff
Mark Moritz	moritz.42@osu.edu		by appointment	
Charlene Brenner	brenner.17@osu.edu		by appointment	

Meeting times: T/Th 10:20-11:15

Location: Baker Systems 130

Course description

Funding agencies worldwide, including the NSF, are placing greater emphasis on interdisciplinary research. For example, the NSF has identified “Growing Convergence Research” as one of its 10 Big Ideas. True convergence research requires the development of interdisciplinary scientific teams (groups of 2 or more working collaboratively to solve a problem). However, graduate students are often siloed within programs, and not necessarily trained to engage with others outside their field. This course aims to teach students the necessary skills to lead or participate in scientific or interdisciplinary teams.

This course will be taught (if possible) in-person with two types of classes per week. The first class in a module (usually Tuesday) will more closely follow a lecture style presentation providing information on Team Science topics. The second class will incorporate activities that apply information learned in the prior lecture. The lectures, activities and assignments are designed to provide students with a handbook for building and maintaining a scientific team by the end of the course.

Students will be graded based on their participation in class and class activities (10%), and completion of assignments (90%).

Course learning outcomes

By the end of this course students should…

1. Be familiar with the Science of team science, specifically:
    a. Explain the main objectives and concepts of team science
    b. Describe the history of team science and the science of team science
    c. Explain the challenges and opportunities of team science
    d. Appreciate how a team science approach can improve interdisciplinary teams
2. Know the best practices for building and leading interdisciplinary teams:
    a. Locate resources for best practices in team science
    b. Articulate the traits of successful interdisciplinary teams
    c. Describe the stages of team formation and steps in building successful teams
    d. Describe the key leadership skills useful in interdisciplinary teams
3. Communicate effectively within interdisciplinary teams:
    a. Recognize how disciplinary and personal backgrounds shape how team members approach the team project.
    b. Reflect on how one's own disciplinary and personal background shapes one's own approach to the team project.
    c. Explain clearly key concepts and methods from one's own discipline to team members from other disciplines.
    d. Ask for clairifications from other team members when concepts and methods from other disciplines are not clear or familiar.
    e. Check for agreement on key concepts and methods used in the team project to ensure a shared understanding.
    f. Appreciate diversity in disciplinary and personal backgrounds and how they contribute to the team project.
4. Lead and collaborate effectively within an interdisciplinary team:
    a. Know different leadership styles
    b. Resolve conflicts
    c. Evaluate team practices.
5. Build an interdisciplinary team that is intentionally collaborative, diverse, equitable, and inclusive.
    a. Identify potential team members that represent diverse backgrounds and expertise.
    b. Include team members in the research activity through collaboration in the project design, implementation, and evaluation.
    c. Consider how tasks and responsibilities are administered fairly and equitably among research collaborators and participants.
    d. Recognize how to leverage diverse perspectives and expertise during all project phases.

    e. Create trust in interdisciplinary teams by participating in activities, listening to others, demonstrating interest, and representing other perspectives with respect.
6. Create a collaboration plan for an interdisciplinary team.
    a. Formulate a team vision, mission, and objectives.
    b. Describe the roles and responsibilities of the team members.
    c. Describe the management processes for decision-making and conflict resolution
    d. Identify the communication technologies used to support team functioning
    e. Identify potential outputs, including authorship and attribution policies
    f. Develop a plan for implementation and maintenance of the collaboration plan

Course materials

Papers and book chapters will be provided on Carmen to aid in learning skills for Tuesday classes. Any additional materials will be provided on Carmen.

Course schedule

Date	Topic	Faculty Involved	Activity Due
8/24	Introduction to and History of Team Science	Alison Bennett	
8/26	Overview of Course Structure and Themes	Alison Bennett	
8/31	Outcomes		Team Science Elevator Pitch
9/2	Team Science Panel		
9/7	Diversity, Equity, and Inclusion	Leo Taylor and Marcela Hernandez	
9/9	Diversity, Equity, and Inclusion	Leo Taylor and Marcela Hernandez	
9/14	Communication Skills	Kim Landsbergen, Courtney Price	
9/16	Communication Skills applied	Courtney Price	Motivation Assessment
9/21	Leadership Skills	Zoë Plakias	

9/23	Leadership Skills applied	Zoë Plakias	
9/28	Reflection Discussion on above course Themes		
9/30	Building Scientific Teams	Liz Kirby, Risa Pesapane	Reflection Essay (Themes)
10/5	Building Scientific Teams applied		
10/7	Building Scientific Teams	Liz Kirby, Risa Pesapane	
10/12	Building Scientific Teams applied		Reflection Essay (Team Building)
10/14	AUTUMN BREAK		
10/19	Team Stages: Form, Storm, Norm, Perform	Alison Bennett	
10/21	Traits of Successful Teams	Mark Moritz, Alison Bennett	
10/26	Reflection Discussion on Team Formation		
10/28	Collaboration Plans	Charlene Brenner, Jeff Agnoli	Reflection Essay (Team formation)
11/2	Collaboration Plan development		Election Day
11/4	Conflict Resolution	Cathy Ryan, Charlene Brenner	Collaboration Plan
11/9	Resolve conflicts		
11/11	VETERANS DAY		
11/16	Collaborations outside science or academia	Jeff Agnoli, Sam White, Risa Pesapane	
11/18	Collaborations outside science or academia	Jeff Agnoli, Sam White, Risa Pesapane	
11/23	TURKEY DAY		
11/30	Meeting Facilitation	Zoë Plakias, Jeff Agnoli	
12/2	Assessment of Team Practices	Cathy Ryan	

12/7	Develop Assessment Plans		
12/9	Reflection on Team Science Course		Assessment Plan; Reflection Essay due during Finals Week

Course technology

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at https://ocio.osu.edu/help/hours, and support for urgent issues is available 24x7.

- **Self-Service and Chat support:** http://ocio.osu.edu/selfservice
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TDD:** 614-688-8743

Necessary software

- Microsoft Office 365 ProPlus All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Each student can install Office on five PCs or Macs, five tablets (Windows, iPad® and Android™) and five phones.
    - Students are able to access Word, Excel, PowerPoint, Outlook and other programs, depending on platform. Users will also receive 1 TB of OneDrive for Business storage.
    - Office 365 is installed within your BuckeyeMail account. Full instructions for downloading and installation can be found https://ocio.osu.edu/kb04733.
- PDF viewing software: Preview (Mac) or Adobe Acrobat (PC and Mac)

Grading and faculty response

Grades and Assignments

There will be five sets of assignments and students will receive participation credit if they regularly come to class and participate in class activities.

Motivation Assessment: Students will take the MatricX (https://matricx.net/) Assessment, and receive full credit if they complete the assessment.

Team Science Elevator Pitch: Students will give a one minute elevator pitch on the importance of Team Science.

Assessment Plan: Based on a case study in class, students will develop an assessment plan for a team science project.

Reflection Essays: Students will complete four essays (two page maximum) focused on topics in the course: the four course themes (communication, leadership, outcomes, and diversity equity and inclusion), team building, team formation, and an overall course reflection. A prompt and a rubric will be provided for the essays, and three out of four the essays will follow a reflection discussion in class. The prompt will ask students to comment on the topic or answer questions as well as to answer two questions: 1) What are some core concepts they learned from the modules? and 2) What are the next steps in your learning about the topics covered in the reflection essay?

Collaboration Plan: The capstone assignment is a collaboration plan for your (current or future) interdisciplinary science team with the following sections: (1) team vision, mission, and objectives; (2) people, roles, and responsibilities; (3) team outputs; (4) team culture; (5) team processes and functioning; (6) project management and infrastructure; and (7) implementation and maintenance of the collaboration plan. Detailed instructions will be provided in CarmenCanvas. Students will be expected to spend two hours per week addressing questions in their own teams in order to develop the collaboration plan, and which questions are addressed each week will be provided in CarmenCanvas and introduced in class.

All assignments will be graded by Drs. Bennett and Brenner, but instructors associated with modules covered by the assignment will provide additional comments.

Assignment or category	Percentage
Course participation	**10%**
Motivation Assessment	**10%**
Team Science Elevator Pitch	**10%**
Collaboration Plan	**20%**
Assessment Plan	**10%**
Reflection Essays (10% each)	**40%**
Total	**100%**

Late assignments

Assignment Due Dates will be announced. All students will be given a one time, 3-day extension for late assignments if needed per semester with no questions asked and no penalties. Please contact us to discuss additional accommodations for extenuating circumstances.

Absence Policy. There are two allowed absences.

Grading scale (percentage)

93–100: A
90–92.9: A-
87–89.9: B+
83–86.9: B
80–82.9: B-
77–79.9: C+
73–76.9: C
70 –72.9: C-
67 –69.9: D+
60 –66.9: D
Below 60: E

Faculty feedback and response time

Remember that you can call **614-688-HELP** at any time if you have a technical problem.

Grading and feedback

For most assignments, you can generally expect feedback within **7 days.**

For the proposals, you can generally expect feedback within **14 days.**

E-mail

Instructors and GTAs will reply to e-mails within **24-36 hours, Monday-Friday**.

Carmen questions

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at https://ocio.osu.edu/help/hours, and support for urgent issues is available 24x7.

- **Self-Service and Chat support:** http://ocio.osu.edu/selfservice
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TDD:** 614-688-8743

Attendance, participation, and discussions

Student participation requirements

Student participation will be based on attendance in class (with up to 2 excused absences), and contribution to discussions when they occur.

Discussion and communication guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style**: While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation.
- **Tone and civility**: Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online.
- **Citing your sources**: When we have academic discussions, please cite your sources to back up what you say.

Other course policies

Land Acknowledgement

We would like to acknowledge that the land The Ohio State University occupies is the ancestral and contemporary territory of the Shawnee, Potawatomi, Delaware, Miami, Peoria, Seneca, Wyandotte, Ojibwe and Cherokee peoples. Specifically, the university resides on land ceded in the 1795 Treaty of Greeneville and the forced removal of tribes through the Indian Removal Act of 1830. We want to honor the resiliency of these tribal nations and recognize the historical contexts that have and continue to affect the Indigenous peoples of this land.

Academic integrity policy

Policies for this online course

- **Written assignments**: Your written assignments, including discussion posts, should be your own original work. In formal assignments, you should

follow **APA** style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in--but no one else should revise or rewrite your work.

- **Summarize your original sources, don't quote or copy**. You should **never** cut and paste text from your original papers (including for figure or table captions). Doing so will result in a severe penalty, even if material is cited. **You must summarize and paraphrase other writers' text**. We will be using originality checking to help us detect sections of text that are not in your own writing. Note that changing a word or two, but otherwise leaving another author's text intact is not sufficient to avoid a penalty (in addition, changing just a word or two often completely alters the meaning of the quoted material). This includes quotations - even if cited properly, you must avoid direct quotations from your source papers. **Under no circumstances may you use a quotation to explain an original source's hypotheses, predictions, results or interpretation of results**.
- **Reusing past work**: In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.
- **Falsifying research or results**: All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your library research look more successful than it was.
- **Group projects**: This course includes group projects, which can be stressful for students when it comes to dividing work, taking credit, and receiving grades and feedback. We have attempted to make the guidelines for group work as clear as possible for each activity and assignment, but please let us know if you have any questions.

Ohio State's academic integrity policy

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 and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus 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. Ignorance of the University's *Code of Student*

Conduct is never considered an "excuse" for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this 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.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages (COAM Home)
- *Ten Suggestions for Preserving Academic Integrity (Ten Suggestions)*
- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Statement on title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at http://titleix.osu.edu or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu

Accessibility accommodations for students with disabilities

Requesting accommodations

If you would like to request academic accommodations based on the impact of a disability qualified under the Americans with Disabilities Act and Section 504 of the

Rehabilitation Act of 1973, contact your instructor privately as soon as possible to discuss your specific needs. Discussions are confidential.

In addition to contacting the instructor, please contact the Student Life Disability Services at 614-292-3307 or ods@osu.edu to register for services and/or to coordinate any accommodations you might need in your courses at The Ohio State University.

Go to http://ods.osu.edu for more information.

Accessibility of course technology

This online course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- Carmen (Canvas) accessibility
- Streaming audio and video
- Synchronous course tools

Your mental health!

A recent American College Health Survey found stress, sleep problems, anxiety, depression, interpersonal concerns, death of a significant other and alcohol use among the top ten health impediments to academic performance. Students experiencing personal problems or situational crises during the quarter are encouraged to contact the College of Pharmacy Office of Student Services in room 150 Parks Hall (614-292-5001) OR OSU Counseling and Consultation Services (614-292-5766) for assistance, support and advocacy. This service is free and confidential.

Grad Sch 8000: Responsible Conduct of Research
Spring 2024

Course overview

Course Information

1 credit hour, in-person Thursday, 10:00-10:55

Research Commons (3rd Floor of 18th Ave Library)

Instructors

Julia Behnfeldt, Ph.D. behnfeldt.10@osu.edu

Mary Kivel kivel.1@osu.edu

Course description

This course is designed to satisfy National Institutes of Health (NIH) and National Science Foundation (NSF) requirements for training in the responsible conduct of research (RCR). The course seeks to provide a practical overview of the rules, regulations, and professional practices that define the responsible conduct of research. This course is open to all graduate students, postdoctoral fellows, and Ohio State staff members who must complete RCR training to fulfill fellowship, training grants or program requirements. Faculty, including those who serve as trainee grant directors, serve as the weekly facilitators for a topic related to their expertise. Faculty will be supported by subject matter experts from the Office of Research and facilitator guides.

Course learning outcomes

Upon completion of this course, you will be able to:

1. Appreciate your role as scientists and responsible members of society.
2. Understand contemporary ethical issues related to scientific research.
3. Recognize research misconduct and identify methods for handling and reporting misconduct.
4. Identify characteristics of safe research environments (e.g., those that promote inclusion and are free of sexual, racial, ethnic, disability and other forms of discriminatory harassment).
5. Evaluate characteristics of a healthy mentor/mentee relationship and the roles of each participant.
6. Analyze conflicts of interest in research and conflicts of commitment.
7. Identify policies regarding human subjects, live vertebrate animal subjects in research, and safe laboratory practices.

Course materials

Required supplemental materials

Course readings will be available on the OSU library site or on the course homepage.

Grading and Faculty Response

Grades

Assignment	Due Date	Percentage
Attendance and Participation	Weekly	35%
Weekly Reflection (x10)	Jan 18, 25; Feb 1, 8, 15, 22, 29; March 21, 28; April 4	25%
Data Management Plan	March 7, 2024	20%
Group Case Study Presentation	April 18, 2024	20%

Assignment Descriptions

Attendance and Class Participation **35%**

Description: Attendance and active participation are essential components to this course. Each weekly Carmen module will contain a brief video lecture and some assigned readings. You should complete the weekly materials prior to class. The class format will be discussion-based. You should come to class ready to engage with both the material and the contributions from your classmates. Attendance and participation will be recorded weekly.

Weekly Reflection x 10 **25%**

Description: There will be ten weekly reflection prompts (dates listed in Carmen). Each prompt will ask you to reflect on the weekly readings, videos, or case studies. After having reflected on the material, you should write a one-page response (approximately 150-200 words) to the prompt. These reflections are due prior to class and are meant to enrich the weekly class discussion.

Data Management Plan **20%**

Description: A data management plan is a document that outlines how data will be handled during and after a research project. You will work to complete a data management plan, including information about data types and sources, content and format, sharing and preservation, data protection, and rationale. A rubric for this assignment can be found in Carmen.

Group Case Study Presentation **20%**

Description: Students will work in small groups to select a case study which exemplifies one of the topics covered in the course. Groups will present their case study to the class in the final week of the course. A rubric for this assignment can be found in Carmen.

Academic integrity and collaboration

Your written assignments should be your own original work. In formal assignments, you should follow APA style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in but no one else should revise or rewrite your work.

Late Assignments

Please refer to Carmen for due dates. Due dates are set to help you stay on pace and to allow timely feedback that will help you complete subsequent assignments.

Instructor Feedback and Response Time

I am providing the following list to give you an idea of my intended availability throughout the course. Remember that you can call 614-688-4357 (HELP) at any time if you have a technical problem.

- **Preferred contact method:** If you have a question, please contact me first through my Ohio State email address. I will reply to emails within **24 hours on days when class is in session at the university**.
- **Class announcements:** I will send all important class-wide messages through the Announcements tool in CarmenCanvas. Please check your notification preferences (go.osu.edu/canvas-notifications) to ensure you receive these messages.
- **Grading and feedback:** For assignments submitted before the due date, I will try to provide feedback and grades within **seven days**. Assignments submitted after the due date may have reduced feedback, and grades may take longer to be posted.]

Grading Scale

This course is graded Satisfactory/Unsatisfactory. As a graduate course, a minimum of 80% is required for a satisfactory grade.

Week	Class Date (Th)	Topics and Assignments
1	January 11	**Research at Ohio State & OSU Shared Values**
2	January 18	**Conflicts of Interest/ Conflicts of Commitment** In-class discussion facilitated by Loren Wold, PhD, FAHA, FAPS *Weekly Reflection #1 due before class January 18*
3	January 25	**Human Subjects Research** In-class discussion facilitated by Maria Gallo, PhD *Weekly Reflection #2 due before class January 25*
4	February 1	**Animal Welfare in Research** In-class discussion facilitated by Brandon Biesiadecki, PhD *Weekly Reflection #3 due before class February 1*
5	February 8	**Mentor/Mentee Relationships** In-class discussion facilitated by Robert Wesolowski, MD *Weekly Reflection #4 due before class February 8*
6	February 15	**Safe and Healthy Research Environments** In-class discussion facilitated by Jeff Kuret, PhD *Weekly Reflection #5 due before class February 15*
7	February 22	**Collaborative Research, Data Management, Sharing and Ownership** In-class discussion facilitated by Cynthia Carnes, PharmD, PhD *Weekly Reflection #6 due before class February 22*
8	February 29	**Data Acquisition and Management** In-class discussion facilitated by Cynthia Carnes, PharmD, PhD *Weekly Reflection #7 due before class February 29*
9	March 7	**Secure and Ethical Data Use; Data Confidentiality** In-class discussion facilitated by Patrick Collins, PhD *Data Management Plan due March 7*
		Happy Spring Break!
10	March 21	**Responsible Authorship and Publication Practices** In-class discussion facilitated by Cynthia Carnes, PharmD, PhD *Weekly Reflection #8 due before class March 21*

Week	Class Date (Th)	Topics and Assignments
11	March 28	**Secure and Confidential Peer Review** In-class discussion facilitated by Susan Mallery, DDS, MS, PhD *Weekly Reflection #9 due before class March 28*
12	April 4	**Research Misconduct** In-class discussion facilitated by Rita Pickler, PhD, RN, FAAN *Weekly Reflection #10 due before class April 4*
13	April 11	**The Researcher in Society** In-class discussion facilitated by Michael Oglesbee, MD
14	April 18	**Group Case Study Presentations** *Case Studies due in class tApril 18*

Course Schedule

Other Course Policies

Discussion and Communication Guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Tone and civility**: Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Respectful interactions are expected.
- **Citing your sources**: When we have academic discussions, please cite your sources to back up what you say.

Ohio State's Academic Integrity Policy

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 and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's Code of Student Conduct (studentconduct.osu.edu), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to

follow the rules and guidelines established in the university's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

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If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the university's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this 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.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- Committee on Academic Misconduct (go.osu.edu/coam)
- Ten Suggestions for Preserving Academic Integrity (go.osu.edu/ten-suggestions)
- Eight Cardinal Rules of Academic Integrity (go.osu.edu/cardinal-rules)

Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

1. Online reporting form at equity.osu.edu,
2. Call 614-247-5838 or TTY 614-688-8605,
3. Or email equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

Your Mental Health

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. No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, on-demand mental health resources (go.osu.edu/ccsondemand) are available. You can reach an on-call counselor when CCS is closed at 614- 292-5766**. 24-hour emergency help** is available through the National Suicide Prevention Lifeline website (suicidepreventionlifeline.org) or by calling 1-800-273-8255(TALK). The Ohio State Wellness app (go.osu.edu/wellnessapp) is also a great resource.

Accessibility Accommodations for Students with Disabilities

The university strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability including mental health, chronic or temporary medical conditions, please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services (SLDS). After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

Disability Services Contact Information

- Phone: 614-292-3307
- Website: slds.osu.edu
- Email: slds@osu.edu
- In person: Baker Hall 098, 113 W. 12th Avenue

Accessibility of Course Technology

This online course requires use of CarmenCanvas (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations as early as possible.

- CarmenCanvas accessibility (go.osu.edu/canvas-accessibility)
- Streaming audio and video
- CarmenZoom accessibility (go.osu.edu/zoom-accessibility)

THE OHIO STATE UNIVERSITY
COLLEGE OF MEDICINE

THE OHIO STATE UNIVERSITY
JOHN GLENN COLLEGE OF PUBLIC AFFAIRS

COURSE INFORMATION

HTHRHSC / PUBAFRS 7574: Mixed Methods Approaches for Policy-Related Research (3 credits)

Tuesdays @ 3:00 – 5:30 pm in (*Location TBD*)

INSTRUCTOR INFORMATION

Jennifer A. Garner, PhD, RD
Assistant Professor of Food and Nutrition Policy
Jennifer.Garner@osumc.edu | (614) 685-0639

School of Health & Rehabilitation Sciences
Office: 243L Atwell Hall
Office Hours: *TBD for Spring 2020*

John Glenn College of Public Affairs
Office: 210N Page Hall
Office Hours: *TBD for Spring 2020*

COURSE DESCRIPTION

Research has powerful potential to inform public policy at the local, state, and federal level, but it is important that researchers design their projects with this end in sight. Policy researchers have access to a variety of methodological tools and can combine qualitative and quantitative data in pragmatic ways to answer important research questions. This course introduces students to theories and methods of data collection techniques, such as in-depth interviews, focus groups, and surveys. It also considers conceptual and methodological reasons for designing a mixed method research study as well as different design options.

Over the course of the semester, we will evaluate the strengths and weaknesses of various mixed method research designs and how to identify a design that is appropriate for your research question. As part of this exploration, the course will compare different paradigms, sample/case selection logics, and types of evaluation associated with qualitative, quantitative, and mixed methods research. We will also discuss and engage in more concrete topics such as building relationships with partners; developing rapport with partners and participants; writing a mixed method research proposal; designing an interview or focus group guide; designing a survey questionnaire; conducting a qualitative interview or focus group; analyzing qualitative and mixed methods data; and publishing mixed methods research.

This course is of best use to students in the beginning (proposal development) stage of a research-focused thesis or doctoral degree. Upper-class undergraduates may enroll with permission.

COURSE GOALS & LEARNING OUTCOMES

Upon successful completion of this course, students will:

A. **Appreciate the historical and contextual factors that motivate the use of mixed methods among contemporary researchers** by…
    1. Describing the advantages and challenges of a taking a mixed methods approach, and
    2. Discussing the worldviews and theoretical lenses through which mixed methods work can be designed;

B. **Understand how conceptual frameworks and study design typologies are used to inform and organize mixed methods research** by…
    1. Comparing the structure and utility of various mixed methods design typologies,
    2. Constructing a framework of key concepts and phenomena to be studied in a mixed methods proposal, and
    3. Selecting and justifying a study design for a mixed methods proposal;

C. **Grasp the unique methodological procedures associated with the conduct of high-quality quantitative and qualitative research** by…
    1. Designing and field-testing qualitative and quantitative data collection tools, and
    2. Planning for and practicing analysis of qualitative and quantitative data;

D. **Know how to integrate quantitative and qualitative methods into mixed methods research proposals for the study of policy-relevant questions** by…
    1. Demonstrating competence in research ethics,
    2. Appraising the quality of mixed methods research studies, and
    3. Developing a comprehensive mixed methods research proposal for the study of a policy-relevant topic.

REQUIRED TEXTS

Creswell JW, Clark VL. *Designing and Conducting Mixed Methods Research*. Sage publications; 2017. 3rd edition. ISBN-13: 978-1483344379.

Fowler Jr FJ. *Survey Research Methods.* Sage publications; 2014. 5th edition. ISBN-13: 978-1452259000.

Weiss RS. *Learning from Strangers: the Art and Method of Qualitative Interview Studies*. Free Press; 1995. 1 edition. ISBN-13: 978-0029346259.

Students can access textbook information via the Barnes & Noble bookstore website (https://ohiostate.bncollege.com) as well as from their BuckeyeLink Student Center. This information is disseminated by B&N to all area bookstores. You may buy from a store of your choice or shop for books online (always use ISBN# for searches).

COURSE EXPECTATIONS

Participation & Readings

Due to the discursive nature of the course's content and the small class size, *most lessons will be run in a seminar-like fashion*. This will provide maximal opportunity for engagement with course content and application to students' own research project(s). Given this format, students will be expected to complete all reading assignments before class. Participation will also involve posting critical, reading-related comments or questions to Carmen ahead of each class; being an active and consistent contributor to in-class discussions; serving as a facilitator of one class discussion (i.e. providing a brief summary of the reading(s) and using peer's posted content to guide discussion); and providing constructive feedback on other student's research plans.

Attendance

Students are expected to be prepared for, attend on-time, and actively participate in all class session and activities. Due to the small class size, long class periods, and participatory nature of the course, absences impede both the student's ability to master course concepts and the entire class dynamic. That being said, I respect that extenuating circumstances may arise. Please exercise professionalism and email me as far in advance as possible regarding any absences.

Assignments

For each major assignment (Assignments 2-5), you will receive a written assignment prompt that includes the assignment description, rubric, due date and time, and mechanism for submission. There will be an opportunity in-class to ask clarifying questions. I am always happy to accept assignments early in cases where the due date conflicts with other obligations. Assignments will not be accepted late except in cases of verified extenuating circumstances.

UNIVERSITY GRADING SCALE

The University's standard grading scheme will be used for this course. Grades will be available for students to view on the course's CARMEN website.

A	100% to 93%	B-	< 83% to 80%	D+	< 70% to 67%
A-	< 93% to 90%	C+	< 80% to 77%	D	< 67% to 60%
B+	< 90% to 87%	C	< 77% to 73%	E	< 60% to 0%
B	< 87% to 83%	C-	< 73% to 70%		

COURSE ACTIVITIES & EVALUATION

Graded Item Type	Quantity	Points per	Total Points
Carmen Postings	12	5	60
Leading Discussion	1	20	20
Assignment 1: Ethics Training	1	20	20
Assignment 2: Study Design & Framework	1	50	50
Assignment 3: Quantitative Methodological Memo	1	50	50
Assignment 4: Qualitative Methodological Memo	1	50	50
Assignment 5: Mixed Methods Research Proposal	1	100	100
TOTAL POINTS FOR THE COURSE			350

Graded Item Descriptions

Carmen Postings (Post) – Every week, I will be start a discussion thread on Carmen for you to use in posting a brief reflection on the week's reading(s) ahead of class. The reflection need not exceed a paragraph. It can contain comments on the readings or questions you have about the content. While there is no rubric for this activity, exceptionally brief posts and those submitted after the deadline will receive zero points. *Posts must be made by 9 a.m. the day before class to allow time for the discussion leader(s) to collate comments and questions for discussion.* You will be exempt from making a post during the week in which you are assigned to lead discussion. The goal of this activity is to promote individual reflection on the readings, including consideration of how content may apply to one's own project; facilitate constructive class discussion; and allow a structured opportunity for students to provide feedback on the utility of assigned readings.

Leading Discussion – During our first class period, we will discuss and set a discussion leader schedule. Depending on course enrollment, 1-2 individuals will lead discussion each week. Discussion leaders will be charged with identifying important points from the reading(s) (5 pts), drawing connections between the reading(s) or prior course content (5 pts), compiling and generating questions for class discussion (5 pts), and demonstrating effort to facilitate a meaningful discussion among classmates (5 pts). No rubric will be provided. PowerPoint may be used, but is not required. Discussion leaders are welcome to consult with me on their discussion plans during office hours or a different, pre-arranged time. The goal of this requirement is to provide students with a structured opportunity to engage more deeply with a subset of course content and to practice group discussion facilitation skills, which are an asset for qualitative data collection and the conduct of both 1:1 interviews and focus groups.

Assignment 1 (A1) – Given the course's emphasis on primary data collection via both quantitative and qualitative means, it is essential that students are familiar with internationally-recognized research ethics and standards. To demonstrate competency of this information, all students must complete Human Subjects Training available via the OSU Institutional Review Board website: https://orrp.osu.edu/irb/training-requirements/citi/ (Click "Access CITI"). *Please complete the track most in line with your planned research*. HRS students may be best served by the Biomedical track, while the Social and Behavioral track may be more appropriate for Glenn College students and others conducting work outside of clinical settings. Allow ~2-3 hours total for completion, though know that you can complete the required modules over multiple sessions. Once complete, please save your completion certificate as a PDF and submit via Carmen. No rubric will be provided. Full credit will be granted based on submission of the completion certificate.

Note: Students should consider their thesis or dissertation research and use assignments 2-5 as an opportunity to prepare a robust research proposal for use toward their degree completion.

Assignment 2 (A2) – This assignment is the first step toward the development of a complete mixed methods research proposal. This assignment will involve the preparation of 1) a conceptual framework that summarizes, visually, the key constructs that you are proposing to study and their relationship to one another, and 2) a diagram that summarizes, visually, the proposed mixed methods study design. These visuals should be accompanied by 2-3 paragraphs outlining your research questions (one to be answered qualitatively, the other quantitatively), your rationale for pursuing these questions (e.g. what research gap are you filling or what policy are you attempting to inform?), a description of your conceptual framework, and a rationale for your study design. A full rubric will be provided at least three weeks in advance of the due date.

Assignment 3 (A3) – For this assignment, you will draft a survey questionnaire to use for the collection of data to answer your "quantitative" research question. The survey should be accompanied by a methodological memo (~1 pg) that details your process for selecting questions (e.g. did you draw upon validated scales? If so, which one(s)?), and summarizes feedback received from peers (during an earlier in-class session) and edits you made accordingly. A full rubric will be provided at least three weeks in advance of the due date.

Assignment 4 (A4) – For this assignment, you will draft either an in-depth interview guide or a focus group guide to use for the collection of data to answer your "qualitative" research question. Please allow time to test the guide with one individual (e.g. a friend, roommate, or someone whom who know that approximates the target sample). Your submission will include the guide, a methodological memo (<1 pg) explaining your process for question development (e.g. how do the questions relate to your conceptual framework?), a coded transcript of your test interview, field notes regarding the circumstances of your test interview (1/2 pg), and a draft qualitative

codebook outlining key initial codes and their definitions. A full rubric will be provided at least three weeks in advance of the due date.

Assignment 5 (A5) – Finally, you will bring your work from assignments two through four together, along with additional content, to prepare a complete mixed methods research proposal. The final proposal should include background on the rationale or motivation for your study, all research questions (and hypotheses, as appropriate), your conceptual framework with explanation, research design with explanation/justification, description of data collection tools (with them attached as appendices), sampling strategy with explanation/justification, statement on the role of research ethics for your study, proposed qualitative and quantitative analytical methods, plan for integration of qualitative and quantitative data, projected implications (e.g. for any policies related to your work), and a project timetable. A full rubric will be provided at least six weeks in advance of the due date.

COURSE CALENDAR

Week	Date	Topic	Readings	Due	Outcomes
1	Jan 6-10	Intro to Mixed Methods	Creswell Ch. 1		A.1.
2	Jan 13-17	Worldviews & Theories	Creswell Ch. 2	Post; A1	A.2., D.1.
3	Jan 20-24	MM Study Designs	Creswell Ch. 3	Post	B.1.
4	Jan 27-31	Shaping your MM Study	Creswell Ch. 5	Post	B.1.
5	Feb 03-07	Collecting MM Data	Creswell Ch. 6	Post; A2	B.2., B.3.
6	Feb 10-14	Survey Methods I	Fowler Ch. 1-4	Post	C.1.
7	Feb 17-21	Survey Methods II	Fowler Ch. 5-7	Post	C.1.
8	Feb 24-28	Quantitative Data Analysis	Fowler Ch. 9-10	Post; A3	C.1., C.2.
9	Mar 02-06	Qualitative Methods I	Weiss Ch. 1-3	Post	C.1.
10	Mar 09-13	SPRING BREAK – NO CLASS			
11	Mar 16-20	Qualitative Methods II	Weiss Ch. 4-5	Post	C.1.
12	Mar 23-27	Qualitative Data Analysis	Weiss Ch. 6	Post	C.2.
13	Mar 30-03	Analyzing MM Data	Creswell Ch. 7	Post; A4	C.2.
14	Apr 06-10	Writing & Evaluating MM	Creswell Ch. 8	Post	D.2.
15	Apr 13-17	Advances in MM	Creswell Ch. 9	Post	D.2.
Final	Apr 22-28	Submit proposal via Carmen by XX am/pm		A5	D.3.

Additional readings will be incorporated into a future version of the syllabus, and will be available on Carmen or as embedded links. Supplementary readings may also be posted to Carmen throughout the semester for optional reading.

COURSE POLICIES

All University, College, School, and Program course policies apply to this course. See your student handbook for more information.

Academic Misconduct – "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 and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's Code of Student Conduct and this syllabus 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. Ignorance of the University's Code of Student Conduct is never considered an excuse for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct. If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this 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." (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct [http://studentconduct.osu.edu/].

Disability Services & Accommodation – The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let faculty know immediately so that we can privately discuss options. To establish reasonable accommodations, we may request that you register with Student Life Disability Services. After registration, make arrangements

with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. **SLDS contact information:** slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue

Counseling and Consultation 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 Counseling and Consultation Services (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 Prevention Hotline at 1-(800)-273-TALK or at** https://suicidepreventionlifeline.org/**. Also, the OSU Student Advocacy Center is a resource to help students navigate OSU and to resolve issues that they encounter at OSU – visit** http://advocacy.osu.edu/**.**

Diversity – "The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited."

Title IX – Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at http://titleix.osu.edu or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu.

Grievances and Solving Problems – For SHRS students, please see SHRS Student Handbook Policy # 5 – Student Appeal Process. In general, a student should meet with the instructor of record for the course first and then, as outlined in Policy #5, a student should then take any problem or grievance to the Division Director.

Conduct in the Classroom and Academic Learning Environment – Students will adhere to the code of student conduct for The Ohio State University at all times. Students in the School of HRS have additional professional requirements for behavior due to the nature of their professional training and the environments in which learning may occur. Please see SHRS Student Handbook Policy # 6.

Copyright – The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

This syllabus, the course elements, policies, and schedule are subject to change in the event of extenuating circumstances. Students will be made aware, in writing, of any such changes.

THE OHIO STATE UNIVERSITY

School of Health and Rehabilitation Sciences
HTHRHSC 7883 - 0010
Responsible Conduct of Research
Summer Session
3 Credit Hours

Instructor:
Nicholas Funderburg PhD
School of Health and Rehabilitation Sciences,
Division of Medical Laboratory Science
Office Location: 535A Atwell Hall

Phone Number: 366 7667
Email: Funderburg.20@osu.edu
Office Hours: To be determined on the first day of class

Class Meeting Schedule:

This 3 Credit course will meet during the summer term, twice a week for 1 hour and 35 minutes per class. Currently, the course is scheduled to meet on Monday and Friday afternoons, from 2:00-3:35PM in 343 Atwell Hall or online if COVID restrictions are in place.

Course Materials / Software:
Required: *On Being a Scientist* (listed as O.B.S. on Schedule)
https://www.nap.edu/catalog/12192/on-being-a-scientist-a-guide-to-responsible-conduct-in

Recommended:
These websites from the National Institutes of Health will be used repeatedly and other resources are listed on the syllabus/schedule as appropriate.
https://ori.hhs.gov/
https://researchtraining.nih.gov/

Course Description:
This discussion based course will address the responsibilities of being an ethical, rigorous and collegial scientist within the domain of health and rehabilitation sciences. Students will read articles, case studies, and on-line modules and actively participate in discussion of the following issues: the protection of human and animal subjects; ethics in collaboration, scientific writing and grant review; and, managing scientific responsibilities. The course will include an on-line component and an in-class portion each week. Required readings and assignments will be used to promote learning.

Prerequisites: Admission to Health and Rehabilitation Sciences PhD program, or permission of instructor. This course is graded A-F as listed below.

Course Learning Outcomes:

- Identify the nine areas of training in Responsible Conduct of Research recommended by the office of research integrity at the NIH (https://ori.hhs.gov/) (https://researchtraining.nih.gov/)
- Based on case studies and national reports, recognize forms of Research Misconduct and describe the likely consequences of being found guilty
- Describe standards for research integrity and challenges arising from issues in Data Acquisition, Management, Sharing and Ownership

- Describe forces driving Collaborative Research, along with pitfalls, ethical considerations, ways to prosper in collaborative endeavors
- Define and recognize when a Conflict of Interest exists in research and describe strategies for managing such conflicts
- Describe expectations for appropriate Commitment of time and resources to a research program
- Delineate Mentor / Trainee Responsibilities for an effective and ethical relationship to train new investigators
- Demonstrate working understanding of publication ethics including issues of authorship, fabrication, plagiarism, sponsorship and redundant publication.
- Demonstrate working understanding of how to provide a critical peer review of a journal manuscript
- Identify steps in the process for obtaining approval for research involving animal subjects
- Demonstrate familiarity with and the ability to locate current guidelines for the use of animals in research
- Possess working knowledge of the application for an animal research protocol at OSU
- Possess a working knowledge of the requirements and process for submitting a protocol/proposal to the Internal Review Board (IRB) at OSU
- Describe the difference between animal welfare and animal rights
- Define what is meant by responsibility for reproducibility and how to obtain it across different lab environments.
- Assess the potential ethical implications of various methods of clinical trial design.

Course Policies:
All School and Program course policies apply to this course. Handbooks are available on the SHRS website: hrs.osu.edu. These provide all required policies and procedures required for students accepted into SHRS academic programs. https://hrs.osu.edu/academics/academic-resources/student-handbooks

Online Structure: (If applicable due to continued COVID restrictions). This course will be conducted in a distance-learning, online format. All materials will be provided via Carmen and all assignments will be completed via Canvas file upload. All necessary materials will be provided in the content section of Carmen. A tutorial is available at https://ocio.osu.edu/audience/students. Notices about this course will be sent to your name.#@buckeyemail.osu.edu account. All students must have an active OSU email account and remain electronically connected to OSU. Emails may be forwarded to an external email address. Please contact the Help Desk for more information.

Course technology: For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at https://ocio.osu.edu/help/hours, and support for urgent issues is available 24x7.
Self-Service and Chat support: http://ocio.osu.edu/selfservice • Phone: 614-688-HELP (4357)
Email: 8help@osu.edu • TDD: 614-688-8743

Safety and health requirements: All teaching staff and students are required to comply with and stay up to date on all University safety and health guidance, which includes wearing a facemask in any indoor space and maintaining a safe physical distance at all times. Non-compliance will be warned first and disciplinary actions will be taken for repeated offenses.

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 and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's Code of Student Conduct and this

syllabus 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. Ignorance of the University's Code of Student Conduct is never considered an excuse for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct. If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this 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." (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct [http://studentconduct.osu.edu/].

Accessibility Accommodations for Students with Disabilities:
The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. **SLDS contact information:** slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Your Mental Health:-Counseling and Consultation Services:
No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you are a student in the School of Health and Rehabilitation Sciences, you may schedule an appointment with our mental health counselors: simply email hrscom.counseling@osumc.edu, indicate which program you are enrolled in and that you are interested in scheduling an initial counseling appointment. If you find yourself feeling isolated, anxious or overwhelmed, on-demand resources are available at go.osu.edu/ccsondemand. 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 Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org. The Ohio State Wellness app is also a great resource available at go.osu.edu/wellnessapp.

Commitment to a diverse and inclusive learning environment: *"The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited."*

Title IX: All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources. If you or someone you know has been harassed or discriminated against based on your sex or gender, including sexual harassment, sexual assault, relationship violence, stalking, or sexual exploitation, you may find information about your rights and options at titleix.osu.edu or by contacting the Ohio State Title IX Coordinator at titleix@osu.edu. Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability. For more information on OIE, visit equity.osu.edu or email equity@osu.edu.

Grievances and Solving Problems: Please see SHRS Student Handbook Policy # 5 and Policy #20 – Student Appeal Process. In general, a student should meet with the instructor of record for the course first and then, as outlined in Policy #5 and #20, a student should then take any problem or grievance to the Division Director.

Conduct in the Classroom and Academic Learning Environment: Students will adhere to the code of student conduct for The Ohio State University at all times. Students in the School of HRS have additional professional requirements for behavior due to the nature of their professional training and the environments in which learning may occur. Please see SHRS Student Handbook Policy # 6.

Trigger Warning Language- "Some contents of this course may involve reading and conversations that may be triggering to some students due to descriptions of and/or scenes depicting acts of violence, acts of war, or sexual violence and its aftermath. If needed, please take care of yourself while watching/reading this material (leaving classroom to take a water/bathroom break, debriefing with a friend, contacting a Sexual Violence Support Coordinator at 614-292-1111.

Student Safety Escort Service-University Escort Service - A safe ride is a service provided to university students who would like safe transportation across campus. Any university student, faculty, or staff member may request a safe ride. Hours: 7pm-3am. Phone: 292-3322."

This syllabus, the course elements, policies, and schedule are subject to change.

Grading and Evaluation:
Graded assignments may come in three forms, and students should note the expectations for each in the descriptions of our class assignments below.
Assignment type:

- **Independent Work (I):** Strictly non-collaborative, original-individual work. You may discuss this assignment only with your instructor. Discussions with other individuals, either in person or electronically, are strictly prohibited.
- **Collaboration Required (C):** An explicit expectation for collaboration among students either in-class or outside (i.e. group work).
- **Optional-Collaboration (O):** Students are permitted, but not required, to discuss the assignment or ideas with each other. However, all submitted work must be one's original and individual creation.

Assignment Name	Points / Weight	Assignment Type
Weekly Reflective Statements (10 total)	5 points each	I
Clinical Trials Design Presentation	10 points	C
Hot Topics Debate Participation	10 points	O
Final Reflection/Book Discussion	15 points	I
Participation during the Class Discussion	15 points	C
TOTAL COURSE POINTS		

Course Assignments:

Reflective Statement. As listed on the schedule, in response to the week's topic(s), write a 1–2 page (typed, double spaced) reflective paper describing what you learned from the CITI modules and other on-line training modules, other readings as assigned, and discussions and cases in the class. Please DO NOT reveal any personal experience you may have had where an ethical dilemma may have arisen. It is a small world, and despite your best efforts to protect identities, it may be evident to your instructor who/what is being described. If you would like to write a confidential memo to yourself indicating what transpired and how your view of the situation has changed based on your new understanding of ethics, then that might be an effective self-directed learning experience, but there is no need for you to reveal that to your instructors. Reflective statements should be submitted via Carmen or via email to the instructor and are due the ***Monday*** following each week's class session.

Hot Topics Debate- Each student will submit 1-2 topics/questions related to science, medicine, and/or ethics. Each topic will need to be approved by the Instructor. Topics/questions should be unique. Pairs of students will be randomly selected to debate a topic. A coin flip will determine who debates the pro versus the con side of the debate. Each debate will consist of an opening statement by each participant (~1-2 minutes for each participant). As appropriate, 1-2 questions from the class/instructor will be allowed, followed by a rebuttal/summation by each participant. The debates will be approximately 10 minutes each. Participants will be expected to provide research/data/citations to support their position. These debates are meant to be thoughtful and respectful. Debate topics and participants will be selected by week 8 of the course and debates will occur during the final week of class. Following the conclusion of the debates, the class will discuss whether or not the debates made them reconsider their own opinions/feelings on the topic or whether or not the debate gave them a greater appreciation for the potential complexities of each topic discussed.

Clinical Trial Design Students will be grouped (as appropriate) and will devise a "clinical trial." Trials will be presented to the class in powerpoint format (~5-10 slides). Each presentation should provide: a background of the question/disease/intervention being tested, any preliminary data that may be available, considerations for human or animal subjects, and expected results/implications of results.

Final Reflective Statement and Book Discussion Each student is to select a book written on a topic related to science, medicine, and or ethics covered in this course. For example:
The Immortal Life of Henrietta Lacks – Rebecca Skloot
Ethics in the Real World – Peter Singer
Medical Apartheid- Harriet A. Washington
And the Band Played On: Politics, People, and the AIDS Epidemic –Randy Shilts

Books need to be approved by the Instructor by the 4th week of class. The final reflection should be at least 5 pages typed, double spaced, discussing the book and placing it in the context of the course. This project will serve as the final examination for this course and the due date will be determined each year.

Grading Scale

A	A-	B+	B	B-	C+	C	C-	D+	D	E
100 - 93%	92.9-90	89.9-87	86.9-83	82.9/80	79.9-77	76.9-73	72.9-70	69.9-67	66.9-60	59.9-0%

Course Schedule

Week #	Dates	Topic	Readings	Assignments Due
1		Responsible Conduct of Research Overview	"Years of Ethics Charges, but Star Cancer Researcher Gets a Pass" https://www.nytimes.com/2017/03/08/science/cancer-carlo-croce.html?_r=0 O.B.S- Introduction to the Responsible Conduct of Research 1 *Terminology:* Values, Standards, and Practices, 3 Research Misconduct, 15 (Optional/skim in class) Public Health Service Concluded Misconduct Investigations – summary http://ori.hhs.gov/case_summary	
2		Data Acquisition, Management, Sharing and Ownership	O.B.S. -The Treatment of Data 8 *Case Study:* The Selection of Data, 10 Mistakes and Negligence 12 *Historic Case Study:* Changing Knowledge, 13 *Case Study:* Discovering an Error, 14 Intellectual Property 39 *Case Study:* A Commercial Opportunity?, 42	Reflection 1
3		Authorship and Collaboration: Opportunities and Pitfalls	O.B.S -Responding to Suspected Violations of Professional Standards 19 *Historic Case Study:* Treatment of Misconduct by a Journal, 21	Reflection 2

			Case Study: A Career in the Balance, 22 Authorship and the Allocation of Credit 35 *Case Study:* Who Gets Credit?, 36 *Historic Case Study:* Who Should Get Credit for the Discovery of Pulsars?, 38	
4		Animal Subjects Training	O.B.S.- Human Participants and Animal Subjects in Research 24 Laboratory Safety in Research 28	Reflection 3
5		Human Subjects Training	O.B.S.- As above and readings assigned (TBD) *Case Study:* Tests on Students, 25 *Case Study:* A Change of Protocol, 26	Reflection 4
6		Human Subjects Training (Continued) Clinical Trial Design Discussion	As above and readings assigned (TBD)	Reflection 5
7		Clinical Trial Student presentations		Reflection 6
8		Navigating IRB Submissions	OSU Buck-IRB website https://orrp.osu.edu/irb/buck-irb/	Reflection 7
9		Conflicts of Interest and Conflicts of Commitment	O.B.S.- Competing Interests, Commitments, and Values 43 *Case Study:* A Conflict of Commitment, 45 *Advice:* Does the Source of Research Funding Influence Research Findings?, 47 Conflict of Interest Forms from OSU	Reflection 8
10		Peer Review of Grants and Publications	O.B.S. - Sharing of Research Results 29 *Historic Case Study:* The Race to Publish, 31 *Case Study:* Publication Practices, 32 *Advice:* Restrictions on Peer Review and the Flow of Scientific Information, 34	Reflection 9
11		Predatory Journals, Open Access Responsibilities in the Mentor/Trainee Relationship		Reflection 10

12		Hot Topics Debates		Final Reflection on the Course and chosen Book

Attendance / Participation Expectations:
Students are expected to be prepared for and actively participate in all class sessions and activities. This is a discussion based course; active involvement in the course is required of all class members.

For Each Class:
Part 1. Background Training. We will primarily use the CITI (Collaborative Institutional Training Initiative). This web-based training program is freely available and was developed with support from the NIH. It is case based and broad. It is also a requirement of OSU for individuals receiving NIH funding. Please complete the CITI training as the course progresses and provide your certificate of completion to the instructor.

The website is https://orc.osu.edu/regulations-policies/rcr/

Part 2. Class Discussion. Class will begin with a review of the basic ethical tenants for the issue at hand. Students are expected to identify and discuss these issues based on background training completed before class. Readings are listed on the schedule and additional reading materials may be assigned as appropriate.

Part 3. Case Studies in Class. Students will be given 1 – 2 case studies for in class discussion and/reference on many of the subjects listed. Students will initially form their own ideas and make notes on the case. Then they will pair up at random to compare ideas and reach consensus. Then a member of each pair will summarize their ideas, and group consensus will emerge, with recognition of minority/alternative viewpoints.

Absence and Makeup Policy and Late Assignment submissions:
- Attendance to the class is required, but is not adequate by itself. Active participation in class discussion is critical to successful completion of this course.
- Tardiness is disruptive to the course, disrespectful to the instructor and will not be excused. You should be in class and prepared to discuss the topics listed on-time unless you have made a prior arrangement with the instructor.
- This syllabus and schedule are subject to change in the event of extenuating circumstances
- Missed classes or late assignments are generally unacceptable, but, if the student seeks approval for a missed class or needs to delay submission of an assignment they should inform the instructor as soon as possible to discuss an appropriate plan of action. Excused absences, makeup assignments or submission of late assignments are not guaranteed and will be considered on a case by case basis.

Instructor Feedback and Response Expectations:
In general, the instructor will respond to emails and messages through Carmen/Canvas within 24 hours. Typically reflections will be graded and returned within 1 week. Feedback on presentations and debates will be provided during the class time and in written format as appropriate.

Copyright:

THE OHIO STATE UNIVERSITY
JOHN GLENN SCHOOL OF PUBLIC AFFAIRS

Public Affairs 7572:

Policy Simulation and Modeling

Autumn 2020

Meeting Days: Tuesday (T) & Thursday (R)

Time: 3:55 pm - 5:15 pm

David Landsbergen	Julie Maurer
310F Page Hall:	250A Page Hall
Telephone: (614) 292-9577	Telephone: (614) 292-7188
Email: landsbergen.1@osu.edu	Email: maurer.99@osu.edu
Office Hours by Appointment	Office Hours by Appointment

DESCRIPTION

The world has many persistent, complicated problems that must be addressed with comprehensive solutions. Crafting these policy solutions requires the appropriate tools that can model the complex systems that generate these problems. These tools must also be intuitive so that decision makers can actively engage with them. Analytical tools, which break down problems into smaller problems, cannot work well when there is intercorrelation, interdependencies, and feedback loops within a larger system. Yet, these interdependencies and multiple feedbacks are the reason why these problems are so difficult to manage. Often, attempts to solve "wicked" problems using an analytical cause-and-effect linear view of the world result in unintended consequences because we are ignoring the effects of the entire system. In this course, students will add two new systems-based tools to their toolkit: system dynamics and agent-based simulation modeling.

This class will benefit students who want to learn to use computer-based policy analysis tools to simulate complex problems, while also considering the challenges that decision-makers experience in their efforts to find empirically based solutions. When confronted with the systemic problems facing our nation, from education to healthcare, intuition alone is insufficient for informing policy decisions. Better policies result when decision makers work with models that are easy to use and easy to understand.

DEGREE LEARNING GOALS

This course provides advanced training in the following MPA degree program goals.

Policy 6 - Evaluate how differences in policy content and systems contribute to policy outputs and outcomes.

Policy 7 - Know and apply basic policy analysis tools.

Econ 1 - Evaluate the quality and validity of economic information.

Mgt 3 - Identify and manage external/ environmental challenges to organizational performance.

Mgt 5 - Engage in strategic planning for public organizations.

Mgt 8 - Manage innovation and change.

Methods 4- Seek and identify patterns in data.

Methods 6 – Support claims with statistically sound quantitative and/or qualitative evidence.

COURSE OBJECTIVES

The following course objectives are designed to meet the above course degree objectives.

Objective	Assessment Tool
Understand systems thinking and why it is important to managing today's complex problems	Group discussions Reflection essays
Understand the value and limitations of simulation modeling for policy analysis and management	Group discussions Reflection essays
Understand the basic approaches to two simulation modeling techniques: Agent-Based and Systems Dynamics models	Practice assignments Group discussions Weekly check-ins
Develop basic skill level in these modeling techniques using AnyLogic, a Java- based simulation software	Practice assignments Group discussions Weekly check-ins
How to write and communicate a simulation modeling proposal	"Memo to Boss" assignment Individual presentation
Develop a simple simulation of a policy or managerial problem	Many subcomponents in Project assignment Weekly check-ins
How to write and communicate the results of a simulation model	Individual or group presentation
Understand the importance and skills in conducting group modeling	Class group model building exercise

COURSE MATERIALS

All course materials can be found online. However, should you have an interest in continuing your studies, you should consider purchasing the Sterman and the Borshchev books as resources.

> Borshchev, A. (2013). *The Big Book of Simulation Modeling: Multimethod Modeling with AnyLogic*. Available on Amazon or the AnyLogic website. Available on Kindle for $5.00
>
> Miller, J.H. and Page, S.E. (2007). *Complex Adaptive Systems: An Introduction to Computational Models of Social Life,* Princeton, NJ: Princeton University Press. Available from main library. 9780691130965
>
> Sterman, J. (2000). *Business Dynamics: Systems Thinking and Modeling for a Complex World*. New York: McGraw-Hill Higher Education. ISBN: 978-0-07-231135-8.

Students can access textbook information via the Barnes & Noble bookstore website: https://ohiostate.bncollege.com as well as from their BuckeyeLink Student Center. This information is disseminated by B&N to all area bookstores. You may buy from a store of your choice and/or shop for books (always use ISBN# for searches) online.

ATTENDANCE AND PARTICIPATION REQUIREMENTS

While the course is an online course, most of scheduled class time will be synchronous meetings and you are required to attend all of these sessions. Tuesdays will typically involve a short demonstration by the instructors. Many of the Thursday sessions will be "lab sessions" during which you can work on your individual assignments or your project. During these labs, the instructors will be available for questions and we will periodically "drop in" on you to say hello.

COURSE RESOURCES

Writing Consulting: Students wishing to have additional help with the writing of their papers can meet with a consultant at the Writing Center (https://cstw.osu.edu/writing-center).

Library Assistance: The Glenn College has a dedicated librarian at OSU Libraries, who can help provide research assistance. Please contact Carly Dearborn (Dearborn.8@osu.edu). For more information and links to some common public affairs resources, see - http://go.osu.edu/8gx.

COURSE TECHNOLOGY

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at https://ocio.osu.edu/help/hours, and support for urgent issues is available 24/7.

- **Self-Service and Chat support:** http://ocio.osu.edu/selfservice
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TDD:** 614-688-8743

Baseline technical skills for online courses

- Basic computer and web-browsing skills
- Navigating Carmen: for questions about specific functionality, see the Canvas Student Guide. Additional navigation instructions are provided within the course.

Required technology skills specific to this course

- CarmenZoom and text chat
- Recording, editing, and uploading video (explanations and instructions are provided on the course website.)

Required equipment

- Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed and tested
- Microphone: built-in laptop or tablet mic or external microphone

Required software

- Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Full instructions for downloading and installation can be found at go.osu.edu/office365help.

Carmen Access

You will need to use BuckeyePass multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click "Enter a Passcode" and then click the "Text me new codes" button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the Duo Mobile application to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and the IT support staff will work out a solution with you.

FACULTY FEEDBACK AND RESPONSE TIME

The following list gives you an idea of our availability throughout the course. (Remember that you can call **614-688-HELP** anytime you have a technical problem.)

- **Broken links or missing resources** – We try to check and recheck to make sure that links are working, but if you find a broken link, please let us know **as soon as possible**. We have made lots and lots of resources available. The downside is a higher likelihood of an error on dates or instructions. If there is any confusion, please ask. **You can earn one point for**

every broken link, erroneous date, or missing resource that is brought to the attention of the instructors. The first person to identify the problem earns the point.

- **Announcements**: We use Announcements as the way to communicate with the class. If you would like to have announcements sent as an email, you can adjust your notification settings. Please see video on how to manage your emails.
- **Grading and feedback:** For large weekly assignments, you can generally expect feedback within the next **4 days** to allow for timely and thoughtful feedback.
- **Email:** The instructor and teaching assistant will reply to emails within **24 hours on days when class is in session at the university** and **48 hours on the weekend**.
- **Discussion board:** We will reply to messages on the logistics discussion boards and the content discussion board within **24 hours on school days**. If you have a question about the course material or the logistics of the class, we prefer that you post the question on the appropriate discussion board first rather than as an email to us, so that everyone has a chance to hear your question and our response. Of course, you are still free to send us an email as not every question need be public.
- **There will be a midterm check-in** with you by using a course survey to see how the course is progressing. We would appreciate any suggestions on how we can improve your learning experience as this is the first time that we are teaching this class online.

POLICY ON GRADING DISPUTES

The assigned grade is designed to show the overall quality of work performed by each student, but errors, mistakes, and omissions can occur. If you believe that any grade was not properly assigned, you may write an email explaining why you believe the grade was incorrectly assigned within one week of receiving the graded assignment back. Each appeal will be considered, and if a re-grade is performed, the entire assignment will be re-graded. The final grade may be greater, less, or equal to the original grade.

LATE ASSIGNMENTS

Late submissions are not accepted except for extenuating circumstances. This is a fast-paced course requiring multiple deliverables. The deliverables, however, are short as they are incremental assignments over the semester that build towards your big final project. You must contact the instructors before the due date. Please refer to Carmen for due dates.

GRADING SCALE

We will use the following grade scale to translate your percentile score into a letter grade.

Letter	Percentage		Letter	Percentage
A	93-100		C+	77-79.9
A-	90-92.9		C	73-76.9
B+	87-89.9		C-	70-72.9
B	83-86.9		D+	67-69.9
B-	80-82.9		D	60-66.9
			E	< 59.9

DISCUSSION AND COMMUNICATION GUIDELINES

The following are our expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful. There is a discussion board for establishing our norms and practices that we will use for our professional communication.

- ***Writing style***: While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation so that you can be understood. A more conversational tone is fine for the discussions and peer feedback. The final deliverable, however, is a professional document to your supervisor and, as such, must be written in professional manner.
- ***Tone and civility***: Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online. Learning requires a willingness to be vulnerable and we will not have great discussions if there is a negative tone or incivility in the class. We have to be willing to risk asking what we fear might be a dumb question or to contribute an interesting comment or observation.
- ***Writing and backing up your work****:* Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.

TYPICAL ACTIVITIES FOR CLASS MODULES DURING THE WEEK

This is an online class that meets twice a week. We will use Zoom to meet synchronously. Typically, the Tuesday class will include a demo or an explanation of that week's subject. On Thursdays, the class time is devoted to lab time. Lab time could include time to work on a simulation exercise and / or work on your project. Depending on the exercise, the virtual lab time will involve us meeting as a class. We may also meet as groups or you may work independently. The instructors and guest instructors will be there to help with any questions you may have.

The instructors are also available to meet by appointment. We do not have office hours because we don't want to help, rather, it is our experience that we sit at the computer with no visits when we do set up office hours. We feel we can be more responsive to your needs by scheduling a mutually convenient time.

Reflections are short assignments asking you to think more deeply about a subject. They should take about an hour's worth of work. Oftentimes, they are the individual work that you are asked to bring into **Discussions**. These discussions sometimes take place during class time and sometimes your comments are posted to a discussion board. Asynchronous discussions take about a half hour to complete. Synchronous discussions will occur class time and will require .5 to .75 of an hour. Discussions are useful in sharing what was learned by individuals in the class. They also reinforce your understanding. **Practice applied assignments** involve a demonstration/ explanation on Tuesdays, followed by lab time on Thursdays. The due date is the next day, Friday, in case you would like to clean something up or try something new. You are required to hand in your Friday assignment by 3 pm so

that you can get an early start on your weekend. Every week we expect you to apply the knowledge gained in that week (**reflections**, **discussions**, **practice assignments**) to the building of your own model.

The biggest assignment is in having you build your own **simulation model project**. You will be working on this model every week starting Week 6 so that you can make steady progress until it is due. We ask that you upload your working model to Box and your "**lab notebook**" to Carmen by Sunday, 7 pm so that we have a chance to review your work for that week. Specific directions for the notebook are in the assignment, but generally, the lab notebook should list what things you tried to do, what worked and did not work, and your biggest barrier at the moment. By turning it in on Sunday night, the instructors will have a chance to review your work over the next two days so that we can give you feedback by Tuesday's class.

GRADING AND COURSE REQUIREMENTS

Grade points

Due Date	Assignment *	Totals	Components
	Course Warm-Up	**15**	
8/26	Getting to Know You and Your Project		5
8/25	Introducing Yourself Video		5
8/26	Quiz on Syllabus and Course Policies		5
	Reflection Essays	**40**	
9/1	How We Can Use Models?		10
9/8	Individuals Create Questions for Speakers		10
9/17	What did you learn from Guest Speakers?		10
10/15	Discussion of Bass and SIR models		10
	Discussion Groups	**50**	
9/3	How We Can Use Models?		10
9/8	Develop Questions for Guests		10
10/17	What did you learn from Guest Speakers?		10
10/27	Group Model-Building		10
11/17	Combining SD and ABM Models		10
	Practice: Simulation Modeling Assignments	**130**	
10/2	SIR Model using SD		40
10/9	Bass model using SD		40
10/22	Group Model Building		40
10/29	Schelling Model Exercise		10
	Policy Simulation Model	**380**	
9/3	"Once Upon a Time" narrative of proposed project		25
9/22	Memo to Boss		25
10/9	Model Proposal		25
10/13,15	Class Presentation of Model Proposal		25
10/14, 16	Individual Comments on Peer's Models		15
9/27-11/29	"Lab Notes" - Posting Weekly Interim Work on Model: 9 weeks @ 15 points		135
12/1,3	Class Presentation of Final Model		30
12/10	Final Project Model		100
	Bonus points for identifying errors @ 1pt each		
	Total	**635**	

* Specific assignment details and due dates can be found on the Carmen website.

Course Components

Course Warm-Up

Getting to Know You and Your Project.
Please provide us with some basic information about the model you would like to build. We also would like to get to know you, including your experiences, interests, and skills.

Introducing Yourself Video.
Please create a video introducing yourself to the class. This is an online class so the video will help us get to know another. Directions on how to create and upload the video are provided.

Quiz on Syllabus and Course Policies.
There are a lot of moving parts in this class. We want to make sure that you have a general idea about the class and how it works. Online classes are different from ion-person classes because we have less of an opportunity to explain and clarify misunderstandings. Consequently, we need more specific online materials in order to communicate well. It is also important to use the online discussion boards if you have a question or if something is not working. Please do so immediately so that we can correct a mistake or misunderstanding. Everyone will benefit from your question and my response. Thank you in advance.

Reflection Essays

How can we use models?
"All models are wrong, but some are useful." Too many people confuse models with reality. They are an approximation to reality. At the same time, models are useful in many ways. When we understand the ways models can be used, we will have a better understanding on when and how to use them. Give all of the discussions about models in the public discourse, this reflection will allow you to be an active participant of this discussion. This individual reflection will require you to be clear about how you think about models, and thereby, become a more engaged discussant in our class discussion.

Develop Individual Questions for Guest Speakers.
We will have two guests who are working with the Ohio Department of Health to discuss their work in modeling the CoVID19 pandemic. On Tuesday, during class, we will be formulating questions for them so that we have some good questions when they visit on Thursday with us. This assignment requires you to individually submit your questions before our class session. Preparing for this discussion will allow us to get the most out of our time with these speakers.

What did you learn from Guest Speakers?
A quick reflection about the guest speaker session will deepen your understanding of the material, make connections to what you already know, and retain what you have learned.

Discussion of Bass and SIR models.
We have two applied assignments in which you develop two popular models: SIR and Bass models. The hope is that you might be able to apply what you have learned in these assignments to your own project model. You may also want to do some 'meta-learning' so that you can reflect on how you learn best to do modeling.

Discussion Groups
Much of what I learned in Graduate School was either self-taught or from my peers. (For example, I learned in a public lab how to log on to IBM CMS mainframe systems in Europe and say hello to whoever was logged on. Pretty damn cool.). Discussion topics are chosen when understanding the material would benefit from sharing diverse perspectives. There are five discussion questions.

How can we use models?
Building on your own understanding of models through the reflection essay, the class discussion will help you refine your thinking, and offer you additional perspectives, on models. The discussion will be synchronous.

Develop Questions for Guest Speakers.
Building on your own set of questions in the reflection essay assignment, we will develop a list of questions for our guest speakers. By doing so, we push our understanding of their work deeper into the material so that we can get full advantage of their time with us. The discussion will be synchronous.

What did you learn from Guest Speakers?
We complete the cycle with our guest speakers by sharing what you learned from the Guest Speaker session. People hear different things so you will all benefit from what others have heard. You will also be able to confirm whether what you heard was heard by others. The discussion will be asynchronous.

Group Model Building.
Simulation modeling, in the end, is a group modeling exercise. Group model building is necessary to gain the perspectives on the complete system. This exercise will allow you to see how important multiple perspectives are and learn some of the basic group modeling building exercises. This will be a live, synchronous session.

Combining SD and ABM Models.
We will be learning about both systems dynamic models and agent-based models. The natural question will arise as to what the strengths of each approach are and how they can compliment each other. This understanding is deepened when we ask how we can combine them. The discussion will be asynchronous.

Application Modeling Assignments

There are four simulation modeling exercises to build skills and build confidence. The instructors will be there to answer your questions. These are good models to learn as they are standard tools in your toolkit.

En-ROADS – This assignment will have us exploring simulation modeling from the decision-maker's perspective. We will learn how important understanding this perspective is for the success of simulation from our guest speakers (I am predicting.). En-ROADS is a web-based interface that allows the decision-maker to manipulate elements of a model in order to understand the system and thereby develop policy.

SIR Model - Susceptible, Infected, Recovery models are used to help modelers understand the spread of disease. A very timely model to learn.

Bass Model - Are a class of models used to simulate the diffusion of things through an economy (innovation, technology, products, ideas). Again, a very useful tool.

Schelling Model Exercise - We will be playing with a table-top exercise to understand how individual agents' actions in response to each other lead to segregation.

Project Simulation Model

You will build a model on a problem of your choosing. Most likely, it will be a systems dynamics model. The strategy is to utilize a series of smaller assignments that allow you to incrementally improve your model over the full 15 weeks of the course. You will be assisted by both instructors. There are a series of smaller modeling exercises that build your set of concepts and skills that can then be applied to your model. Please note that the highest percent of your grade will be earned by the work you do each week on your project ("Lab Notes"; higher than the final project deliverable).

You are required to develop your individual model until the first presentation of your model proposal in Week 8. At that point, you may decide to work together in wo-person groups. The work done up until this time serves as a backstop should you run into problems with your group model.

- Course Warm-up Survey: (includes questions about your proposed model)
- "Once Upon a Time" narrative of proposed project – you begin to understand the problem in your own words
- Memo to Boss: Learn how to explain simulation modeling and how to justify a research proposal
- Present Model to Class for suggestions: Learn how to give and get feedback
- Final Project Model – You will be responsible for completing a final project of your choice. It will be assessed using "face validity." Full details can be found on Carmen.
- Class Presentation of Final Model – Practice presenting model again this time focusing on presenting results to a decision-maker.
- Lab Notes – Each week you will be presenting the work you did that week with comments on where you are "stuck" and what you plan to work on next.

ACADEMIC MISCONDUCT

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 and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus 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. Ignorance of the University's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If we suspect that a student has committed academic misconduct in this course, we are obligated by University Rules to report our suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this 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. Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages (COAM Home)
- *Ten Suggestions for Preserving Academic Integrity (Ten Suggestions)*
- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

Having given you the requisite legal notice, let's look at the reality. One of the most important ways to learn is through collaboration. Even if one person knows more than another person, just explaining it to someone else, deepens your understanding. (We joke as instructors that "teaching is learning.") Over the course of the semester you will be spending a lot of time building simulations using AnyLogic. Collaboration with your classmates is encouraged, but you must submit individual assignments. Directions for each assignment will make it clear what is individual work and what is collaborative work. We require demonstration of learning through groups and through individual learning (the best way to learn in my opinion).

STATEMENT ON TITLE IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at http://titleix.osu.edu or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu

COVID RESPONSIBILITIES

Safety and health requirements: All teaching staff and students are required to comply with and stay up to date on all University safety and health guidance, which includes wearing a face mask in any indoor space and maintaining a safe physical distance at all times. Non-compliance will be warned first and disciplinary actions will be taken for repeated offenses.

FERPA AND PRIVACY IN CARMENZOOM

Video and audio recordings of class lectures will be part of the classroom activity. The video and audio recording is used for educational use/purposes and may be made available to all students presently enrolled in the course. The *Family Educational Rights and Privacy Act* (FERPA) protects **a**ll meetings held in CarmenZoom that include course content or student information. Please see this CarmenZoom privacy link to learn more.

COVID PROCESS SLDS STATEMENT

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307, 098 Baker Hall, 113 W. 12th Avenue.

GLENN COLLEGE DIVERSITY VALUES STATEMENT

The Glenn College is committed to nurturing a diverse and inclusive environment for our students, faculty, staff, and guests that celebrates the fundamental value and dignity of everyone by recognizing differences and supporting individuality. We are dedicated to creating a safe space and promoting civil discourse that acknowledges and embraces diverse perspectives on issues and challenges that affect our community.

YOUR MENTAL HEALTH

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 is 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 Counseling and Consultation Services (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

https://suicidepreventionlifeline.org/. Also, the OSU Student Advocacy Center is a resource to help students navigate OSU and to resolve issues that they encounter at OSU – visit http://advocacy.osu.edu/.

ACCESSIBILITY ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

Requesting accommodations

If you would like to request academic accommodations based on the impact of a disability qualified under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, contact your instructor privately as soon as possible to discuss your specific needs. Discussions are confidential. In addition to contacting the instructor, please contact the Student Life Disability Services at 614-292-3307 or ods@osu.edu to register for services and/or to coordinate any accommodations you might need in your courses at The Ohio State University.
Go to http://ods.osu.edu for more information.

Accessibility of course technology

This online course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- Carmen (Canvas) accessibility
- Streaming audio and video

SCHEDULE

Week - Topic	Readings	Assignments / Activities
8/25, 8/27 1. Introduction to Class and Systems Models	Sterman, "Learning in and about Complex Systems" Page, Scott, "Model Thinker" Epstein, Joshua, "Why Model?"	Warm-up - Getting to Know You and Your Project (Due 8/26) Warm-up - Video Introduction (Due 8/25) Warm-up - Syllabus and Course Policy Quiz (Due 8/26)
9/1, 9/3 2: Introduction to Simulation Models	Sterman, "The Modeling Process" Hightower, "Iterative Story-Telling"	T: Reflection - How do we use models? R: Discussion - How do we use models? R: Project - "Once upon a time..." narrative of project
9/8, 9/10 3: Simulation at the Front Lines: COVID at the Ohio Department of Health	Guest Speakers: Ayaz Hyder, Sam Malloy, OSU COVID-19 simulation modeling team for ODH Wilensky & Rand (2017), "Agent-Based Modeling" Materials provided by Guests	T: Reflection - Create Individual Question for Discussion T: Discussion - Create questions for Guest Speakers R: Guest Speakers R: Install AnyLogic
9/15, 9/17 4: Simulation from a Decision-Maker's Perspective	En-ROADS materials	T: Reflection -What did you learn from guest speakers? T, R: En-ROADS – Run-Time Simulation R: Discussion - What did you learn from guest speakers?
9/22, 9/24 5: Stock-and-flow diagrams and accumulations	Sterman, "Stock-and-Flow Models" (Big Reading)	T: Project - Memo to Boss, (Due 9/22) T: Practice: Stocks and Flows Exercises on Stock and Flows R: Practice: Stock and Flow exercise/apply to project model Sun: Project - Post Lab Notes Due
9/29, 10/1 6: System Dynamics: SIR Models	AnyLogic in 3 days (Systems Dynamics, pp. 101-131) (SIR model) Ghaffarzadegan, "Small Models in Policy"	T: Practice - Demo SIR model R: Practice - Work on SIR model (Due 10/2) Sun: Project - Post Lab Notes Due
10/6, 10/8 7: Bass Models	Bass Model Assignment	T: Demo Bass Model R: Practice - Work on SIR model (Due 10/9) Sun: Project - Post Lab Notes Due

10/13, 10/15 8: Share project model proposals in class and class provides feedback	Materials for creating and assessing presentations	T: Reflection - What you learned from SIR and Bass R: Discussion - What you learned from SIR and Bass T, R: Project - Present Project Proposals W, F: Project - Feedback on Discussion Board Sun: Project - Post Lab Notes Due
10/20, 10/22 9: System Dynamics Group Model-Building – Infant Mortality	Hosseinichimeh, "Group Model Building" Hovmand, "Group Model-Building 'Scripts'" ODH, "Ohio Infant Mortality Report" ODH, "Infant Mortality in Ohio (2011-2018)'	T: Introduce GMB (Guest Speaker) R: Practice - GMB Build a conceptual model Sun: Project - Post Lab Notes Due
10/27, 10/29 10: Agent-Based Modeling Understanding Agent Based Modeling	Schelling, "Micromotives and Microbehaviors" Schelling, "Models of Segregation" Zhong, "Pandemic Influenza Simulation"	T: Discuss - GMB exercise T: Practice - Schelling Segregation Exercise in Class (10/28) R: Project - Work on Project Model Sun: Project - Post Lab Notes Due
11/3, 11/5 11: Complex Adaptive Systems	Miller and Page, "Complex Adaptive Systems": Grimm, "ODD protocol"	T: Introduce ODD Protocol R: Model individuals in your model – In Class Exercise Sun: Project - Post Lab Notes Due
11/10, 11/12 12: Combining ABM and SD Methods	Swinerd & McNaught, "Hybrid Simulation" Gajary, "Hybrid Modeling"	T: Dr. Maurer presents her dissertation R: Project - Work on Project Model Sun: Project - Post Lab Notes Due
11/17, 11/19 13: Final work on Structure of Model	Lab Time During Regular Class Time	T: Discuss Combining ABM and SD models T, R: Instructors will help refine models Sun: Project - Post Lab Notes Due
11/24, (Thanksgiving) 14: Clean-up model. Documentation.	Lab Time Tuesday	Sun: Project - Post working model for presentation next week Sun: Project - Post Lab Notes
12/1, 12/3 15: Present / Final Changes		T, R: Class presentations
Final Exam Week		Final Model Due: Thursday, Due Dec. 10, 5 pm

THE OHIO STATE UNIVERSITY
COLLEGE OF PUBLIC HEALTH

PUBHBIO 5280 – Introduction to Genomic Data Analysis
3 credits – Spring 2023

Course Instructor: Kellie J. Archer, PhD

Office location/phone number: 240 Cunz Hall, 614-247-6167

E-mail: archer.43@osu.edu

Graduate Teaching Assistant: None

Office Hours: Optional office hours are held **via Zoom**; see the course Carmen site for links.

Day of Week	Time
Tuesday	2PM-3PM
Friday	11AM-noon

Course Description: This course is aimed at both graduate and advanced undergraduate students. This course provides an introduction to different high-throughput genomic assays (e.g., custom spotted and oligonucleotide microarrays, sequencing assays, methylation assays). This course will provide an overview of pre-processing methods including image analysis, normalization, alignment, and expression summary/quantification methods. Various statistical methods including supervised and unsupervised methods for genomic data analysis and their software implementation will be illustrated using datasets from different platforms.

Prerequisites: Junior standing or above, and Math 1151 or 1156, Stats 2450 or 2480, and Biology 1113 or MolGen 5660; or Grad standing; or permission of instructor.

Course Class Sessions and Mode of Delivery: This course consists of 100% online delivery of the class sessions via asynchronous Distance Learning (DL) mode. There are **no required sessions when you must be logged in to Carmen at a scheduled time**. (There are more details on page 3 under Class Format.)

Course Learning Objectives:
Upon successful completion of the course, students will have the knowledge, comprehension and/or skills to be able to apply commonly used statistical analysis methods to genomic data. Particularly, the students will be able to:

1. Describe different high-throughput genomic technologies.
2. Apply pre-processing methods to translate raw data to analyzable numerical quantities.
3. Use software to perform differential expressed gene detection, p-value adjustment, unsupervised/supervised machine learning, and dimension reduction for general genomic datasets.
4. Apply the statistical methods for summarizing, visualization and analysis of data from high-throughput platforms, including microarray and sequencing technologies.
5. Describe the basic principles of genomic data annotation, linkage, and storage.
6. Interpret the results of a statistical analysis in the context of relevant biological and public health questions.
7. Propose experimental and statistical approaches to address unanswered biological and public health questions using genomic methods.

Public Health Foundational Knowledge Objectives (PHK):

3. Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health.
8. Explain biological and genetic factors that affect a population's health

Public Health Foundational Competencies (PHFC):

2. Select quantitative and qualitative data collection methods appropriate for a given public health context
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
4. Interpret results of data analysis for public health research, policy or practice

MPH in Biostatistics Competencies:

1. Address problems arising in public health and medicine through appropriate statements of hypotheses, study design, data collection, data management, statistical analysis, and interpretation of results.
3. Describe basic concepts of probability, random variation and commonly used statistical probability distributions.
4. Use computational methods to effectively analyze complex public health and medical data.

MS in Biostatistics Competencies:

7. Address problems arising in public health and medicine through appropriate statements of hypotheses, study design, data collection, data management, statistical analysis, and interpretation of results.
9. Explain core concepts of probability, random variation and commonly used statistical probability distributions and how they relate to statistical inference.
10. Use computational methods to effectively analyze complex public health and medical data.

Interdisciplinary PhD in Biostatistics Learning Goals:

1. Understands the theoretical foundations of statistical methods.
2. Can design biological or health-related research studies and construct and implement statistical analysis plans appropriate for such studies.
3. Can effectively communicate the results of statistical analyses to statistical and non-statistical audiences.

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

Diversity Statement

The Ohio State University affirms the importance and value of diversity of people and ideas. We believe in creating equitable research opportunities for all students and to providing programs and curricula that allow our students to understand critical societal challenges from diverse perspectives and aspire to use research to promote sustainable solutions for all. We are committed to maintaining an inclusive community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among all members; and encourages each individual to strive to reach

their own potential. The Ohio State University does not discriminate on the basis of age, ancestry, color, disability, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, race, religion, sex, gender, sexual orientation, pregnancy, protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment.

To learn more about diversity, equity, and inclusion and for opportunities to get involved, please visit:
https://odi.osu.edu/
https://odi.osu.edu/racial-justice-resources
https://odi.osu.edu/focus-on-racial-justice
http://mcc.osu.edu/

Carmen: There is a Carmen site for this course: https://carmen.osu.edu. All course materials are available via Carmen.

You will need to use BuckeyePass (buckeyepass.osu.edu) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device help article for step-by-step instructions (https://cybersecurity.osu.edu/news/2018/09/04/buckeyepass-how-make-changes-and-manage-devices)
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the Duo Mobile application (https://digitalflagship.osu.edu/handbook/ch3/duo) to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357(HELP) and IT support staff will work out a solution with you.

Class Format: How this online course works

- **Mode of delivery:** This course is 100% online delivery via asynchronous Distance Learning (DL) mode. There are **no required sessions when you must be logged in to Carmen at a scheduled time**.
- **Pace of online activities:** This course is divided into **weekly modules**. Students are expected to keep pace with weekly deadlines but may freely schedule their efforts within that time frame.
- **Credit hours and work expectations:** This is a **3-credit-hour course**. According to Ohio State policy (go.osu.edu/credithours), students should expect around 3 hours per week of time spent on direct instruction (e.g., watching recorded lectures, completing active learning activities such as computer labs, taking quizzes) in addition to 6 hours of homework (reading and assignment preparation) to receive a grade of (C) average.
- **Attendance and participation requirements:** Because this is an online course, your attendance is based on your online activity and participation. The following is a summary of students' expected participation:
    - **Participating in online activities for attendance**: **AT LEAST ONCE PER WEEK**
      You are expected to log in to the course in Carmen every week. (During most weeks you will probably log in many times.) If you have a situation that might cause you to miss an entire week of class, discuss it with the instructors *as soon as possible.*
    - **Office hours and live sessions**: **OPTIONAL**
      All live, scheduled events for the course, including office hours, are optional.

- **Participating in discussion forums**: **OPTIONAL**
  Discussion boards will be a place to interact with the instructor, for example, to ask questions about the material and assignments. Participation is optional, but highly encouraged.

Text/Readings: There is no required textbook for this class. Readings from free online sources will be provided via Carmen. Some of these resources will require you to be logged in to the library website (http://library.osu.edu) with your OSU name.#.

Course technology

Technology skills needed for this course

- Basic computer and web-browsing skills
- Navigating Carmen (go.osu.edu/canvasstudent)
- CarmenZoom virtual meetings (go.osu.edu/zoom-meetings) - optional

Required equipment

- **Computer:** current Mac (MacOs) or PC (Windows 10) with high-speed internet connection
- **Other:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

Optional equipment (for participation in optional live office hours and/or review sessions)

- **Webcam:** built-in or external webcam, fully installed and tested
- **Microphone:** built-in laptop or tablet mic or external microphone

Required software

- R (http://www.r-project.org/), which is available free online. You will be provided with installations the first week of the semester.
- Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365. Full instructions for downloading and installation can be found at go.osu.edu/office365help.

Technology support

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the Ohio State IT Service Desk. Standard support hours are available at ocio.osu.edu/help/hours, and support for urgent issues is available 24/7.

- **Self-Service and Chat support:** ocio.osu.edu/help
- **Phone:** 614-688-4357(HELP)
- **Email:** servicedesk@osu.edu
- **TDD:** 614-688-8743

Assignments/Assessments

Labs: Each week has an associated lab assignment. These provide an opportunity for you to implement the concepts covered in the lectures (often using R), and completion of these exercises is a key component of this course. **Students are permitted to work together on labs but submitted assignments must be completed independently.**

Any lab not completed by the end of the week will be given a 0. There are no exceptions to this rule.

Quizzes: Each week has a short online multiple-choice/fill in the blank quiz (taken via Carmen) to help reinforce understanding of the covered concepts. Students may take up to two attempts at each quiz; the highest quiz score will be kept. Please note that quiz questions may be slightly different on the second attempt. You cannot stop a quiz, logout/login and resume at a later time. **Quizzes must be completed without the help of other individuals, but books and notes are permitted.**

Homeworks: Homework assignments will assess student understanding of the underlying biological principles leveraged in genomic assays and pre-processing methods and statistical analyses of genomic data. The due dates for assignments will be announced and all assignments are due on the assigned date by 11:59pm. **Students are permitted to work together on Homework, but submitted assignments must be written independently.**

In order for homework assignments to be graded and returned as quickly as possible, late homework will not be accepted and will receive a 0.

Learning Check-Ins: Every week you will complete a short online reflection of your learning for that week's material. This short, three-question questionnaire is meant to help you reflect on your learning (metacognition) and to provide us with valuable feedback on what topics are the "muddiest." These will be graded S/U based on "good faith" effort answering the three questions.

Final Project: The final project will showcase students understanding of methods in genomic data analysis in their appropriate biological context. Each student will submit a written project due on Wednesday, April 26.

Exams: There are no exams.

Grading: Final class grade will be determined as follows:

Quizzes	10%
Homework	30%
Lab Assignments	40%
Learning Check-Ins	5%
Final Project	15%

Grading Scale: This course will use the standard OSU grading scheme*:

93 to 100	A	87 to <90	B+	77 to <80	C+	60 to <70	D
90 to <93	A-	84 to <87	B	74 to <77	C	≤59	E
		80 to <84	B-	70 to <74	C-		

**The instructors reserve the right to adjust the grading scale if it appears necessary due to overall class performance. These adjustments will only raise a student's grade, not lower it.*

Assignment Scoring: Clear and effective communication is crucial in biostatistics. This rule is applied to all assignments (e.g., homework, project). In any problem-solving question it is the student's responsibility to make sure that he/she/they justifies his/her/their answer and provides enough detail for the grader to understand. Points may be deducted for answers that are not well-justified, even if they are correct.

Any questions regarding grading must be addressed **within one week** of the return of the assignment. As a general policy, when requested, the regrading will apply to the whole assignment, not just to the specific part which the student thinks there might be a mistake. Consequently, regrading may lead to a lower overall score. **Any questions regarding grading must be directed to the professors and not the TA.**

Policies for this Online Course

- **Quizzes**: Quizzes must be completed without the help of other individuals, but books and notes are permitted.
- **Homework Assignments:** Students are permitted to work together on homework, but submitted assignments must be written independently.
- **Lab Assignments:** Students are permitted to work together on lab assignments but submitted assignments must be completed independently. Since these are an active learning component

through which students will learn to use the statistical methods described in lecture, it is to the student's benefit to initially attempt these independently.
- **Final Project**: This course includes a final project, which should be completed independently. Books, notes, and other outside materials are permitted.
- **Learning Check-Ins:** These reflections should be completed individually (without collaboration).

Faculty Feedback & Response Time: The following gives you an idea of our intended availability during the course:

- **Grading:** You can generally expect feedback within 7 days.
- **E-mail:** I will respond to e-mails (set via Carmen) within 24 hours on school days.
- **Discussion board:** The instructor will check and reply to messages in the discussion boards at least every 12 hours on school days, and every 24 hours on weekends, unless a different turnaround time (due to travel, etc.) is announced.

Office of Student Life: Disability Services

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process (slds.osu.edu/covid-19-info/covid-related-accommodation-requests/), managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let the instructors know immediately so that we can privately discuss options. To establish reasonable accommodations, we may request that you register with Student Life Disability Services. After registration, make arrangements with us as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Religious Accommodations

Our inclusive environment allows for religious expression. Students requesting accommodations based on faith, religious or a spiritual belief system in regard to examinations, other academic requirements or absences, are required to provide the instructor with written notice of specific dates for which the student requests alternative accommodations at the earliest possible date. For more information about religious accommodations at Ohio State, visit odi.osu.edu/religious-accommodations.

Weather or other short-term closure

As this is a fully asynchronous course via online delivery, no adjustments to the course schedule or due dates will be made for Weather or other short-term closures.

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.

CCAMPIS Program

The Office of Diversity and Inclusion provides holistic support for qualifying student parents enrolled at Ohio State. To learn more, contact the "Child Care Access Means Parents in School" (CCAMPIS) Program at 614-247-7092, lewis.40@osu.edu, or visit http://odi.osu.edu/ccampis.

Statement on Title IX

All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources. If you or someone you know has been harassed or discriminated against based on your sex or gender, including sexual harassment, sexual assault, relationship violence, stalking, or sexual exploitation, you may find information about your rights and options on Ohio State's Title IX website (http://titleix.osu.edu) or by contacting the Ohio State Title IX Coordinator at titleix@osu.edu. Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability. For more information, visit the OIE website (equity.osu.edu) or email equity@osu.edu.

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 the instructors.

Course Schedule* (with Alignment of Course Learning Objectives, Foundational Knowledge, and Foundational Competencies)

Week	Topics	Assignments	Course Learning Objectives	Foundational Knowledge Areas	Foundational Competencies
1/09 to 1/15	**MODULE 1 – Introduction to R**	Module Quiz 1 Lab 1 Learning Check-in 1	CLO3, CLO4		PHFC3
1/16 To 1/22	**MODULE 2 – Introduction to genomic assays** • Principles of hybridization • Custom spotted arrays • Oligonucleotide arrays • RNA-Seq	Module Quiz 2 Lab 2 Learning Check-in 2	CLO1	PHK3 PHK8	PHFC2
1/23 to 1/29	**MODULE 3 – Preprocessing: Image Analysis** • Computer representation of images • Addressing • Segmentation • Intensity extraction	Module Quiz 3 Lab 3 Learning Check-in 3	CLO2	PHK3	PHFC3
1/30 to 2/05	**MODULE 4 – Preprocessing: Alignment** • FASTA and FASTQ formats • cutadapt • Bowtie, STAR, kallisto	Module Quiz 4 Lab 4 Learning Check-in 4 Homework 1 Due	CLO2	PHK3	PHFC3
2/06 to 2/12	**MODULE 5 – Preprocessing: Normalization** • MA plots • Lowess normalization • Quantile normalization	Module Quiz 5 Lab 5 Learning Check-in 5	CLO2	PHK3	PHFC3
2/13 to 2/19	**MODULE 6 – Preprocessing: Expression Quantification** • Affymetrix methods • Robust multiarray average (RMA) • Expression quantification for RNA-Seq	Module Quiz 6 Lab 6 Learning Check-in 6	CLO2	PHK3	PHFC3
2/20 to 2/26	**MODULE 7 – Differential gene expression analysis** • Traditional tests • False Discovery Rate • Limma	Module Quiz 7 Lab 7 Learning Check-in 7 Homework 2 due	CLO3, CLO4, CLO5, CLO6	PHK3 PHK8	PHFC3 PHFC4

Week	Topics	Assignments	Course Learning Objectives	Foundational Knowledge Areas	Foundational Competencies
2/27 to 3/05	**MODULE 8 – Differential gene expression analysis (PART 2)** • DESeq2 • VST and rlog transformation	Module Quiz 8 Lab 8 Learning Check-in 8	CLO3, CLO4, CLO5, CLO6	PHK3 PHK8	PHFC3 PHFC4
3/06 to 3/12	**MODULE 9 – Unsupervised learning methods** • Hierarchical clustering • K-means clustering • Partitioning around medoids	Module Quiz 9 Lab 9 Learning Check-in 9 Homework 3 due	CLO3, CLO4, CLO6	PHK3 PHK8	PHFC3 PHFC4
3/13 to 3/19	***Spring Break (no new material or assignments)***				
3/20 to 3/26	**MODULE 10 – Supervised learning methods** • LASSO • Elastic Net • Cross-validation	Module Quiz 10 Lab 10 Learning Check-in 10	CLO3, CLO4, CLO6	PHK3 PHK8	PHFC3 PHFC4
3/27 to 4/02	**MODULE 11 – Supervised learning methods** • Linear Discriminant Analysis • Kernel Discriminant Analysis • K-nearest neighbors • CART, bootstrap aggregating, and Random Forest	Module Quiz 11 Lab 11 Learning Check-in 11	CLO3, CLO4, CLO6	PHK3 PHK8	PHFC3 PHFC4
4/03 to 4/09	**MODULE 12 – Dimension reduction** • PCA and MDS • t-SNE • PLS and CCA	Module Quiz 12 Lab 12 Learning Check-in 12 Homework 4 due	CLO3, CLO4	PHK3	PHFC3
4/10 to 4/16	**MODULE 13 – DNA methylation data and analysis** • Biological background • Assays (array/sequencing) • Preprocessing • Differential methylation analysis • Cell count adjustment • DNA methylation age	Module Quiz 13 Lab 13 Learning Check-in 13	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6	PHK3 PHK8	PHFC2 PHFC3 PHFC4

Week	Topics	Assignments	Course Learning Objectives	Foundational Knowledge Areas	Foundational Competencies
4/17 to 4/23	**MODULE 14 – Microbiome data analysis** • Phyloseq • Alpha and beta diversity • PERMANOVA and MiRKAT	Module Quiz 14 Learning Check-in 14	CLO1, CLO2, CLO3, CLO4, CLO6	PHK3 PHK8	PHFC2 PHFC3
4/26	**Final Project Due**	Project	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6, CLO7	PHK3 PHK8	PHFC2 PHFC3 PHFC4

**Any readings for each week will be posted on Carmen*

THE OHIO STATE UNIVERSITY
COLLEGE OF PUBLIC HEALTH

PUBHBIO 6210 – Applied Biostatistics I

3 credit hours – Autumn, 2023

Instructor: James B. Odei, Ph.D.
Email: odei.3@osu.edu
Office: 248 Cunz Hall
Phone: 614-247-8048

Office Hours: Fridays 11:30am–12:30pm EST or by Appointment via (OSU Carmen) Zoom

Zoom Link:
https://osu.zoom.us/j/95561372940?pwd=OWZtdTVJUWh0S3orb3FHSElkR0FOZz09
Meeting ID: 955 6137 2940
Password: 522364

TA: Carson Richardson (richardson.1297@buckeyemail.osu.edu)

TA Office Hours: Mondays 11:45am–12:45pm EST via (OSU Carmen) Zoom

Zoom Link:
https://osu.zoom.us/j/93012181730?pwd=NGFwRXVvZWZWMXdIa09JUDhtOXRKZz09
Meeting ID: 930 1218 1730
Password: 624971

TA Responsibilities: The TA assigned to the course will assist in moderating the discussion boards and hold office hours. The TA will grade homework assignments and may assist with scoring exams; however, final grades will be assigned by the professor. **Any questions regarding grading must be directed to the professor and not the TA.**

Course Description: This course provides students with a comprehensive introduction to the principles of modern biostatistical methods and their applications in biomedical research. The course will cover material from basic data summary methods to estimation and hypothesis testing, emphasizing the understanding of methodologies from a statistical inference perspective. Application to real data from various studies in public health will be provided.

Prerequisites: Graduate standing in Public Health, or enrollment in MACPR program, or permission of instructor.

Course Learning Objectives (1-7) and Module Learning Objectives (1.1-7.6)

Upon successful completion of this course, students will be able to:

1. **Explain fundamental probability concepts and perform basic probability calculations**
   - 1.1. Define key probability terms (sample space, union, intersection, etc.)
   - 1.2. Select and use the appropriate probability rules (additive, multiplicative, Bayes') to perform probability calculations
   - 1.3. Describe the application of probability in diagnostic testing

2. **Select the appropriate probability model and use that model to perform calculations**
   2.1. Define a random variable and describe the difference between the two types: discrete and continuous
   2.2. Describe characteristics of random variables with the following distributions: Bernoulli, Binomial, Poisson, Uniform (continuous), Normal
   2.3. Identify the appropriate distribution for a random variable arising from specific, common circumstances
   2.4. Perform probability calculations for random variables having a specific distribution
3. **Choose, calculate, and interpret the appropriate graphical and numerical data summaries**
   3.1. Distinguish between different types of quantitative data
   3.2. Create and interpret frequency tables
   3.3. Create and interpret graphical displays such as bar graphs, histograms, box plots
   3.4. Calculate and interpret measures of central tendency: mean, median, mode
   3.5. Calculate and interpret measures of spread: range, percentiles, interquartile range, standard deviation, variance, coefficient of variation
   3.6. Calculate and interpret proportions, risk differences, relative risks, odds ratios
4. **Calculate and interpret confidence intervals**
   4.1. Construct and interpret confidence intervals for means
   4.2. Construct and interpret confidence intervals for proportions
   4.3. State the Central Limit Theorem (CLT) and explain its application to confidence interval construction and statistical inference
5. **Explain the fundamentals of hypothesis testing**
   5.1. Differentiate between the null and alternative hypotheses
   5.2. Construct one and two-sided hypotheses
   5.3. Define and interpret p-values
   5.4. Define type I and type II errors
   5.5. Explain the duality of hypothesis testing and confidence intervals
   5.6. Explain what factors impact the power of a hypothesis test
6. **Execute and interpret hypotheses tests**
   6.1. Perform and interpret one-sample, two-sample, and paired t-tests for means
   6.2. Perform and interpret one-sample and two-sample tests for proportions based on normal theory
   6.3. Perform and interpret the test of the slope in a simple linear regression analysis
7. **Execute and interpret a simple linear regression analysis**
   7.1. Construct and interpret a scatterplot to show the relationship between two continuous variables
   7.2. Explain the setup, rationale, and assumptions of simple linear regression
   7.3. Define the model for the mean and the model for individual outcome values
   7.4. Interpret the model coefficients in simple linear regression
   7.5. Make predictions with a given simple linear regression equation
   7.6. Calculate and interpret Pearson correlation coefficients

Degree Program Competencies

Foundational Public Health Knowledge:

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

Foundational MPH Competencies

- Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate (3)
- Interpret results of data analysis for public health research, policy or practice (4)

MPH-Biostatistics Specialization Competencies

- Address problems arising in public health and medicine through appropriate statements of hypotheses, study design, data collection, data management, statistical analysis, and interpretation of results (1)
- Describe basic concepts of probability, random variation and commonly used statistical probability distributions (4)
- Use computational methods to effectively analyze complex public health and medical data (5)

MS-Biostatistics Specialization Competencies

- Address problems arising in public health and medicine through appropriate statements of hypotheses, study design, data collection, data management, statistical analysis, and interpretation of results (7)
- Explain core concepts of probability, random variation and commonly used statistical probability distributions and how they relate to statistical inference (9)
- Use computational methods to effectively analyze complex public health and medical data (10)

Alignment of Course Assessments with Degree Program Competencies

Assessment	Foundational Public Health Knowledge	Foundational MPH Competencies	MPH-Biostatistics Specialization Competencies	MS-Biostatistics Specialization Competencies
Quizzes	3, 6	4	1, 4	7, 9
Homework	–	3, 4	1, 4, 5	7, 9, 10
Online – Midterm Exam	–	4	1, 4	7, 9
Online – Final Exam	–	4	1, 4	7, 9
Take-home – Midterm Exam	–	3, 4	1, 4, 5	7, 9, 10
Take-home – Final Exam	–	3, 4	1, 4, 5	7, 9, 10

Class Format:

Mode of Delivery: This course meets **100% online** (**Asynchronous**). There are no required sessions when you must be logged in to Carmen at a scheduled time.

Pace of Delivery: The course is structured into 7 blocks that each last either 1 week or 2 weeks, plus a short introductory block. Each block (except Block 0) starts at 12:00am EST on a Monday and ends at 11:59pm EST on a Sunday (see calendar for specific dates). Each block consists of (a) recorded lectures to be watched asynchronously, (b) short online quizzes, (c) recorded sample problems, (d) practice exercises, (e) homework assignments, and (f) supplemental readings. All asynchronous activities will be accessible via Carmen.

Credit Hours and Work Expectations: This is a 3-credit-hour course. According to Ohio State policy (go.osu.edu/credithours), students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of (C) average.

Attendance and Participation Requirements:

Because this is an online course, your attendance is based on your online activity and participation. The following is a summary of students' expected participation:

- **Participating in online activities for attendance: AT LEAST ONCE PER WEEK**
  You are expected to log in to the course in Carmen every week. (During most weeks you will probably log in many times.) If you have a situation that might cause you to miss an entire week of class, discuss it with me as soon as possible.
- **Office hours and live sessions: OPTIONAL**
  All live, scheduled events for the course, including my office hours, are optional.
- **Participation in discussion forums: UP TO 2 TIMES PER WEEK**
  As part of your participation, each week you can expect to post up to twice as part of our substantive class discussion on the week's topics or activities.

Required Text:

There is **no** required textbook for this class. (Optional) readings from various sources will be posted on Carmen, including from the books listed below.

Digital/Free Reference Text:

Biostatistics and Epidemiology: A Primer for Health and Biomedical Professionals, 4^{th} Edition, by Wassertheil-Smoller and Smoller (2015)
http://link.springer.com/book/10.1007/978-1-4939-2134-8.
You must access the book online using a university computer or be logged in through the library website if accessing from off campus (you can download a PDF for offline use).

Print Reference Texts:

Fundamentals of Biostatistics, 7^{th} Edition, by Rosner (2011)
Introduction to the Practice of Statistics, 7^{th} Edition, by Moore, McCabe, and Craig (2012)
Principles of Biostatistics, 2^{nd} Edition, by Pagano and Gauvreau (2000)

Calculator:

Students should have access to a scientific calculator that can perform basic arithmetic, square roots, logarithms, and exponentiation. For this online class, a program such as Microsoft Excel may suffice.

Required Software: STATA (http://www.stata.com/)
For the purpose of illustration and to get the best computing support, **students are required to use STATA for all homework**. There are two options for accessing STATA:

1. Purchase STATA (https://www.stata.com/order/new/edu/profplus/student-pricing/) for your personal computer (Windows or Mac)
2. Use the PCs in the OSU Cunz Hall computer lab (2nd Floor, room 230)

If you do not plan to use STATA ever again after this course, you can consider purchasing the 6-month Stata/BE. If you will be continuing on to PUBHBIO 6211 or conducting statistical analyses for your research, I strongly recommend purchasing the perpetual Stata/BE. Since there is no required text, you can consider purchasing STATA as your "book costs" for the course.

Carmen Access: There is a Carmen site for this course. Login at http://carmen.osu.edu with your OSU internet username (**name.#**) and password then go to PUBHBIO 6210. The site will contain the syllabus, recorded lectures, quizzes, assignments, and additional course materials. All assignments **must** be turned in electronically via the Carmen dropbox, unless otherwise directed.

You will need to use BuckeyePass (buckeyepass.osu.edu) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device help article for step-by-step instructions (go.osu.edu/add-device).
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click "**Enter a Passcode**" and then click the "**Text me new codes**" button that appears. This will text you ten passcodes good for 365 days that can each be used once.
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If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and the IT support staff will work out a solution with you.

Carmen Zoom: Any online office hours and/or online review sessions will be held via OSU Carmen Zoom. Information about using OSU Carmen Zoom as a participant can be found at: https://teaching.resources.osu.edu/toolsets/carmenzoom.

Faculty Feedback & Response Time:

The following list gives you an idea of my intended availability throughout the course. (Remember that you can call **614-688-HELP** at any time if you have a technical problem.)

- **Grading and feedback:** For large weekly assignments, you can generally expect feedback within **7-10 days**.
- **E-mail:** I will reply to e-mails within **24 hours on school days**.
- **Discussion board:** Either the TA or I will check and reply to messages in the discussion boards at least every **12 hours on school days**, and every **24 hours on weekends**, unless a different turn around time (due to travel, etc.) is announced.

Course Technology:

1. *TECHNOLOGY SUPPORT*

   For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at `https://ocio.osu.edu/help/hours`, and support for urgent issues is available 24/7.

   - **Self-Service and Chat support:** `http://ocio.osu.edu/selfservice`
   - **Phone:** 614-688-HELP (4357)
   - **Email:** 8help@osu.edu
   - **TDD:** 614-688-8743

2. *TECHNOLOGY SKILLS NEEDED FOR THIS COURSE*

   - Basic computer and web-browsing skills
   - Navigating Carmen (go.osu.edu/canvasstudent): for questions about specific functionality, see the Canvas Student Guide.
   - CarmenZoom virtual meetings (go.osu.edu/zoom-meetings)

3. *REQUIRED EQUIPMENT*

   - Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
   - Webcam: built-in or external webcam, fully installed and tested
   - Microphone: built-in laptop or tablet mic or external microphone
   - Other: a mobile device (smartphone or tablet) or landline to use for BuckeyePass authentication

4. *REQUIRED SOFTWARE*

   - Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365. Full instructions for downloading and installation can be found at go.osu.edu/office365help.

Grading: Final class grade will be determined as follows:

Homework	20%
Quizzes	10%
Midterm – take-home component	20%
Midterm – online, timed component	15%
Final – take-home component	20%
Final – online, timed component	15%

Grading Scale*:

94 to 100	A	87 to $<$ 90	B+	77 to $<$ 80	C+	60 to $<$ 70	D
90 to $<$ 94	A-	84 to $<$ 87	B	74 to $<$ 77	C	$\leq$ 59	E
		80 to $<$ 84	B-	70 to $<$ 74	C-		

**The instructor reserves the right to adjust the grading scale if it appears necessary due to overall class performance. These adjustments will only raise a student's grade, not lower it.*

Grade Policy: The Division of Biostatistics has established a grade policy for progressing from PUBHBIO 6210 to PUBHBIO 6211. **A grade of B- or higher in PUBHBIO 6210 is required to enroll in PUBHBIO 6211.**

Exams: There will be two exams in this course: a midterm exam and a final exam. Each exam will have two parts: (a) a take-home component and (b) an online, timed component. The exams will have multiple-choice and short-answer questions. Many questions will require students to perform calculations and will require the use of a calculator. The take-home portions will require the use of Stata (but the online portions will not).

The **take-home component** for each exam will be available for download from Carmen for a 3 day period at the dates shown on the course calendar. Students may download the exam at any time in the window and must submit their completed take-home exams **electronically** via a Carmen dropbox by **11:59pm EST** on the last day of the 3 day period (date shown on course calendar).

The **online, timed exam component** for each exam will be done via Carmen and will be available for a 3 day period at the dates shown on the course calendar. Students may choose any time in the window to take the exam and will have 80 minutes to complete it once started. Exams must be completed by **11:59pm EST** on the last day of the 3 day period (date shown on course calendar). A student cannot stop the test, logout/login and resume at a later time.

Exams **must** be taken within the scheduled windows. Students who miss taking any exam will be penalized fully in the absence of a documented excuse. Students with a problem taking a midterm or the final exam during the scheduled window must contact the instructor immediately upon discovery of the problem. **Exams must be completed without the help of other individuals, but books and notes are permitted.**

Quizzes:

Each recorded lecture has an associated short online mutiple-choice quiz (taken via Carmen) to help reinforce understanding of the covered concepts. Students may take up to two attempts at each quiz; if two attempts are taken then the quiz score will be the average of the two. Please note that quiz questions may be slightly different on the second attempt. A student cannot stop the quiz, logout/login and resume at a later time. **Quizzes must be completed without the help of other individuals, but books and notes are permitted.**

All materials for a block will be simultaneously available for the entire block so that students can watch the lectures and take the quizzes at times that best fit their schedules. Any quiz not completed by the end of the block will be given a 0. **There are no exceptions to this rule.**

Homework:

Each block (except the short intro block, Block 0) has a corresponding homework assignment. These assignments are due on the end date of the block by **11:59pm EST**. Homework assignments will include both hand-calculation and computer (Stata) exercises. Students are permitted (indeed, encouraged) to work together on homework, but submitted assignments must be written independently.

In order for homework to be graded and returned as quickly as possible, late homework will not be accepted and will receive a zero. The lowest homework score (zero or otherwise) will be deleted before computing the overall homework grade.

Online Submission:

Students are required to turn homework assignments and the take-home exam components **electronically** via the provided Carmen dropboxes by the dates/times listed on the course website for each assignment. In order to facilitate grading, **assignments must be submitted as either Microsoft Word documents or as PDF files.** Using Microsoft Word to write up assignments is encouraged, but not required. It is the student's responsibility to ensure that any hand-written problems that are scanned for submission as PDFs are clearly legible.

Homework/ Exam Scoring:

Clear and effective communication is crucial in statistical practice. This rule is applied to both homework and exams. In any problem-solving question it is the student's responsibility to make sure that he/she justifies his/her answer and provides enough detail for the grader to understand. Points may be deducted for answers that are not well-justified, even if they are correct.

Any questions regarding grading must be addressed **within one week** of the return of the homework or exams. No request of regrading on previous homework or exams will be accepted after the final exam except for the last homework and the final exam. As a general policy, when requested, the regrading will apply to the whole exam or the homework, not just to the specific part which the student thinks there might be a mistake. As a consequence, regrading may lead to a lower overall score. Any questions regarding grading must be **directed to the professor and not the TA**.

Disclaimer: This syllabus should be taken as a fairly reliable guide for the course content. However, you cannot claim any rights from it and in particular I reserve the right to change due dates or the methods of assessment. Official announcements will **always** be those posted on the course website (Carmen).

Copyright Disclaimer: The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

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.

Statement with COVID Process Addition

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. **SLDS contact information:** slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Disability Statement

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options for your specific needs. You are also welcome to register with Student Life Disability Services to establish reasonable accommodations. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. Please contact the Office of Student Life: Disability Services at 614-292-3307 (TDD: 614-292-0901) in room 098 Baker Hall (113 W. 12th Avenue) to coordinate reasonable accommodations for students with documented disabilities (https://slds.osu.edu). More resources regarding accessibility can be found at: https://ada.osu.edu/resources-0.

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 https://suicidepreventionlifeline.org.

Student Support

A recent American College Health Survey found stress, sleep problems, anxiety, depression, interpersonal concerns, death of a significant other and alcohol use among the top ten health impediments to academic performance. Students experiencing personal problems or situational crises during the semester are encouraged to contact OSU Counseling and Consultation Services (292-5766; http://ccs.osu.edu) for assistance, support and advocacy. This service is free to students and is confidential.

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 College'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 (http://oaa.osu.edu/coam.html). Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct*, the *Student Handbook*, and this syllabus 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. Ignorance of the *Code of Student Conduct* and the *Student Handbook* is never considered an "excuse" for academic misconduct, so I recommend that you review the *Code of Student Conduct* and the *Student Handbook*, specifically, the sections dealing with academic misconduct.

If I suspect a student of academic misconduct in this course, I am obligated by University Rules to report these suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this 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.

Statement on Title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at https://titleix.osu.edu or by contacting the Ohio State Title IX Coordinator, Melissa Mayhan, at titleix@osu.edu or 614-247-5838.

Course Calendar (*subject to change; most current version is always posted to Carmen*)

Dates	Block	Assignments*	Learning Objectives
8/22 – 8/27	**BLOCK 0: Introduction**	1 Quiz (Practice)	3.1
(1 week)	0A Biostatistics Terminology		
8/28 – 9/10	**BLOCK 1: Foundations of Probability**	4 Quizzes	1.1, 1.2, 1.3
(2 weeks$^{\alpha}$)	1A Basic Probability 1	Homework 1	
	1B Basic Probability 2		
	1C Conditional Probability		
	1D Bayes Rule		
	9/4 : NO CLASS – Labor Day		
9/11 – 9/24	**BLOCK 2: Population Models**	4 Quizzes	2.1, 2.2, 2.3, 2.4
(2 weeks)	2A Random Variables	Homework 2	
	2B Discrete Models		
	2C Continuous Models		
	2D Standard Normal and Z-scores		
9/25 – 10/1	**BLOCK 3: Data and Samples**	3 Quizzes	3.2, 3.3, 3.4, 3.5
(1 week$^{\gamma}$)	3A Summarizing Categorical Data	Homework 3	
	3B Measures of Central Tendency		
	3C Measures of Spread		
10/3 – 10/5	**MIDTERM – take-home component**		
10/6 – 10/8	**MIDTERM – online component**		
10/9 – 10/22	**BLOCK 4: Estimation for Means**	4 Quizzes	4.1, 4.3, 5.1, 5.2,
(2 weeks$^{\beta}$)	4A Introduction to Point Estimation	Homework 4	5.3, 5.4, 5.5
	4B Confidence Intervals Based on Z		
	4C Confidence Intervals Based on t		
	4D Introduction to Hypothesis Tests		
	10/12 – 10/13 : NO CLASS – Autumn Break		
10/23 – 11/5	**BLOCK 5: Inference for Means**	4 Quizzes	5.6, 6.1
(2 weeks)	5A One-sample Tests for Means	Homework 5	
	5B Two-sample Tests for Means		
	5C Tests for Paired Data		
	5D Power and Sample Size		
11/6 – 11/19	**BLOCK 6: Proportions**	3 Quizzes	3.6, 4.2, 6.2
(2 weeks$^{\alpha}$)	6A Inference for One Proportion	Homework 6	
	6B Inference for Multiple Proportions		
	6C Measures of Association		
	11/10 : NO CLASS – Veteran's Day		
11/20 – 12/3	**BLOCK 7: Regression and Correlation**	3 Quizzes	7.1, 7.2, 7.3, 7.4
(2 weeks$^{\beta}$)	7A Regression: Intro and Estimation	Homework 7	7.5, 6.3, 7.6
	7B Regression: Inference		
	7C Correlation		
	11/23 – 11/24 : NO CLASS – Thanksgiving Break		
	11/25 : NO CLASS – Columbus/Indigenous Peoples' Day		
12/5 – 12/7	**FINAL – take-home component**		
12/8 – 12/10	**FINAL – online component**		

*All homework assignments and quizzes are due at **11:59pm EST on the due dates** that will be announced on Carmen.

$^{\gamma}$***Note #1:*** *Block 3 is only 1 week long to accommodate the midterm week; plan accordingly.*

$^{\alpha}$***Note #2:*** *Blocks 1 and 6 include Labor Day and Veteran's Day, respectively, and are adjusted to accommodate the final week; plan accordingly.*

$^{\beta}$***Note #3:*** *Blocks 4 and 7 include the Autumn Break and Thanksgiving Break/Columbus Day week, respectively, and are adjusted to accommodate the final week; plan accordingly.*

Note #4: *Blocks always open at 12:00am EST and are* ***not*** *all the same "size". They range from 3 to 4 lectures, with varying lecture lengths. Please pay careful attention to the number and lengths of the posted lectures.*

Optional readings corresponding to each lecture will be posted on Carmen.

THE OHIO STATE UNIVERSITY
COLLEGE OF PUBLIC HEALTH

PUBHBIO 6211 – Applied Biostatistics II

3 credit hours – Spring, 2024

Instructor: James B. Odei, Ph.D.
Email: odei.3@osu.edu
Office: 248 Cunz Hall
Phone: 614-247-8048

Class Time and Location: Tuesdays/Thursdays 12:45pm–2:05pm EST, Cunz Hall–Room 140

Office Hours: Tuesdays/Thursdays 11:30am–12:30pm EST or by Appointment; **in-person** (Cunz Hall–Room 248) or via (OSU Carmen) Zoom

Zoom Link:
https://osu.zoom.us/j/92779429480?pwd=S2djQW96NDhDbEdZVlV3TFVkd2pJdz09
Meeting ID: 927 7942 9480
Password: 242217

TA: Abbey Marshall (marshall.1011@buckeyemail.osu.edu)

TA Office Hours: Wednesdays 10:00am–11:00am EST, via (OSU Carmen) Zoom

Zoom Link:
https://osu.zoom.us/j/99945963493?pwd=MzdlU1NSVEVxMXA4YStOdzdBZlFUZz09
Meeting ID: 999 4596 3493
Password: 789523

TA Responsibilities: The TA assigned to the course will hold regular office hours and lead review sessions for any students who need help with class material. The TA will assist with scoring homework assignments and exams; however, final grades will be assigned by the professor. **Any questions regarding grading must be directed to the professor and not the TA.**

Course Description: A second course in applied biostatistical methods with an emphasis on regression methods commonly used in the health sciences. The focus is on linear regression and the Analysis of Variance (ANOVA). Integrated with use of computer statistical packages.

Prerequisites: A grade of B- or above in PUBHBIO 6210, PUBHLTH 6001, or permission of instructor.

Class Format: In-person lectures (Cunz Hall–Room 140).

Class Policies: The class will move quickly and cover a substantial amount of material; thus, attendance at each class is expected. Homework must be submitted electronically by the indicated due date. Graded homework assignments and exams will be returned in person (or through carmen). See "Required Software" for specific policies regarding statistical software.

Course Learning Objectives (1-10)

Upon successful completion of this course, students will be able to:

1. Interpret the results of a linear regression analysis
2. Perform hypothesis tests in the context of linear regression
3. Assess the fit of a linear regression model and make appropriate modifications if necessary
4. Explain the concept of confounding in the context of linear regression
5. Use statistical software to fit a linear regression model
6. Interpret the results of one- and two-way ANOVA analyses
7. Explain the problem of multiple comparisons and perform appropriate adjustments in the context of an ANOVA model
8. Describe the use of nonparametric tests as an alternative analysis approach
9. Interpret the results of a basic logistic regression analysis
10. Interpret the results of a basic survival analysis

Degree Program Competencies

Foundational MPH Competencies

- Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate (3)
- Interpret results of data analysis for public health research, policy or practice (4)

MPH-Biostatistics Specialization Competencies

- Address problems arising in public health and medicine through appropriate statements of hypotheses, study design, data collection, data management, statistical analysis, and interpretation of results (1)
- Describe basic concepts of probability, random variation and commonly used statistical probability distributions (4)
- Use computational methods to effectively analyze complex public health and medical data (5)

MS-Biostatistics Specialization Competencies

- Address problems arising in public health and medicine through appropriate statements of hypotheses, study design, data collection, data management, statistical analysis, and interpretation of results (7)
- Explain core concepts of probability, random variation and commonly used statistical probability distributions and how they relate to statistical inference (9)
- Use computational methods to effectively analyze complex public health and medical data (10)

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

Alignment of Course Assessments with Degree Program Competencies

Assessment	Foundational MPH Competencies	MPH-Biostatistics Specialization Competencies	MS-Biostatistics Specialization Competencies
Homework	3, 4	1, 4, 5	7, 9, 10
Midterm Exam 1	4	1, 4	7, 9
Midterm Exam 2	4	1, 4	7, 9
Final Exam	4	1, 4	7, 9

Credit Hours and Work Expectations:

This is a 3-credit-hour course. According to Ohio State policy (go.osu.edu/credithours), students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of (C) average.

Texts:

Strongly suggested:

Applied Logistic Regression, 3^{rd} Edition, by Hosmer, Lemeshow, and Sturdivant (2013). A Wiley-Interscience Publication, John Wiley & Sons Inc., New York, NY. https://onlinelibrary.wiley.com/doi/book/10.1002/9781118548387.

Suggested:

Applied Regression Analysis and Other Multivariable Methods, 4^{th} Edition, by Kleinbaum, Kupper, Muller, and Nizam (2008). Duxbury Applied Series.

Notes:

PDF Files of all the PowerPoint slides used in the lectures as well as other material will be posted on Carmen. If possible, I would suggest printing the slides and establishing a course packet for future reference.

Digital/Free Reference Text:

Regression Methods in Biostatistics: Linear, Logistic, Survival and Repeated Measures Models, 2^{nd} Edition, by Vittinghoff, Glidden, Shiboski, and McCulloch (2012) Available **free for OSU students** at: http://link.springer.com/book/10.1007/978-1-4614-1353-0.

You must access the book online using a university computer or be logged in through the library website if accessing from off campus (you can download a PDF for offline use).

Print Reference Texts:

- *Fundamentals of Biostatistics*, 8^{th} Edition, by Rosner (2015).
- *Applied Regression Analysis and Other Multivariable Methods*, 5^{th} Edition, by Kleinbaum, Kupper, Nizam, and Rosenberg (2014).
- *Introduction to the Practice of Statistics*, 7^{th} Edition, by Moore, McCabe, and Craig (2012).
- *Applied Survival Analysis: Regression Modeling of Time To Event Data*, 2^{nd} Edition, by Hosmer, Lemeshow, and May (2008).
- *Principles of Biostatistics*, 2^{nd} Edition, by Pagano and Gauvreau (2000).

Calculator:

Students should have access to a scientific calculator that can perform basic arithmetic, square roots, logarithms, and exponentiation.

Required Software:

STATA (http://www.stata.com/)
For the purpose of illustration and to get the best computing support, **students are required to use STATA for all homework in this course**. There are two options for accessing STATA:

1. Purchase the software directly from STATA (https://www.stata.com/order/new/edu/profplus/student-pricing/) for your personal computer (Windows or Mac)
2. Use the PCs in the OSU Cunz Hall computer lab (2nd Floor, room 230)

If you do not plan to use STATA ever again after this course, you can consider purchasing the 6-month Stata/BE. If you will be taking additional biostatistics courses or conducting statistical analyses for your own research, I strongly recommend purchasing a longer license (e.g., perpetual Stata/BE; you may wish to discuss this choice with the instructor and/or your academic advisor). Since there is no required text, you can consider purchasing STATA as your "book costs" for the course.

Carmen Access:

There is a Carmen site for this course. Login at http://carmen.osu.edu with your OSU internet username (**name.#**) and password then go to PUBHBIO 6210. The site will contain the syllabus, recorded lectures, quizzes, assignments, and additional course materials. All assignments **must** be turned in electronically via the Carmen dropbox, unless otherwise directed.

You will need to use BuckeyePass (buckeyepass.osu.edu) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device help article for step-by-step instructions (go.osu.edu/add-device).
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click "**Enter a Passcode**" and then click the "**Text me new codes**" button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the Duo Mobile application (go.osu.edu/install-duo) to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and the IT support staff will work out a solution with you.

Carmen Zoom:

Any online office hours and/or online review sessions will be held via OSU Carmen Zoom. Information about using OSU Carmen Zoom as a participant can be found at: https://teaching.resources.osu.edu/toolsets/carmenzoom.

Faculty Feedback & Response Time:

The following list gives you an idea of my intended availability throughout the course. (Remember that you can call **614-688-HELP** at any time if you have a technical problem.)

- **Grading and feedback:** For large weekly assignments, you can generally expect feedback within **7-10 days**.
- **E-mail:** I will reply to e-mails within **24 hours on school days**.

Course Technology:

1. *TECHNOLOGY SUPPORT*

   For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at https://ocio.osu.edu/help/hours, and support for urgent issues is available 24/7.

   - **Self-Service and Chat support:** http://ocio.osu.edu/selfservice
   - **Phone:** 614-688-HELP (4357)
   - **Email:** 8help@osu.edu
   - **TDD:** 614-688-8743

2. *TECHNOLOGY SKILLS NEEDED FOR THIS COURSE*
   - Basic computer and web-browsing skills
   - Navigating Carmen (go.osu.edu/canvasstudent): for questions about specific functionality, see the Canvas Student Guide.
   - CarmenZoom virtual meetings (go.osu.edu/zoom-meetings)

3. *REQUIRED EQUIPMENT*
   - Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
   - Webcam: built-in or external webcam, fully installed and tested
   - Microphone: built-in laptop or tablet mic or external microphone
   - Other: a mobile device (smartphone or tablet) or landline to use for BuckeyePass authentication

4. *REQUIRED SOFTWARE*
   - Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365. Full instructions for downloading and installation can be found at go.osu.edu/office365help.

Grading:

Final class grade will be determined as follows:

Homework	25%	
Midterm Exam 1	25%	February 22
Midterm Exam 2	25%	March 21
Final Exam	25%	April 25, Time TBD

Grading Scale*:

94 to 100	A	87 to < 90	B+	77 to < 80	C+	67 to < 70	D+
90 to < 94	A-	84 to < 87	B	74 to < 77	C	60 to < 67	D
		80 to < 84	B-	70 to < 74	C-	< 60	E

**The instructor reserves the right to adjust the grading scale if it appears necessary due to overall class performance. These adjustments will only raise a student's grade, not lower it.*

Exams:

There will be 3 open book/open notes exams. You must complete all exams yourself, without any external help or communication. Calculators may be used during the exam but laptops and phones are not permitted.

Completed exams must be turned in to the TA at the designated time. Because exams are returned to students as quickly as possible, it is not possible for any student to take an exam late. Students who miss taking any exam will be penalized fully in the absence of a documented excuse. Similarly, the final exam must be taken during the scheduled time window. Students with a problem taking an exam at the scheduled time must contact the instructor immediately upon discovery of the problem.

Exams **must** be taken within the scheduled windows. Students who miss taking any exam will be penalized fully in the absence of a documented excuse. Students with a problem taking a midterm or the final exam during the scheduled window must contact the instructor immediately upon discovery of the problem. **Exams must be completed without the help of other individuals, but books and notes are permitted.**

Homework:

Each homework assignment is due by the designated date and time. Homework assignments will include analysis of quantitative data using the statistical methods introduced in the course lectures. Homework will include both hand-calculations and computer (Stata) exercises. There will be seven (7) homework assignments.

In order for homework to be graded and returned as quickly as possible, late homework will not be accepted and will receive a zero. Students are permitted and encouraged to work together on homework, but submitted assignments must be written independently, including all Stata code and output from the computer. Students are required to submit completed homework solutions electronically via Carmen. Email is only an option for emergencies. In such cases, the student assumes full responsibility for ensuring the instructor receives the assignment on time and can open the attachment successfully.

Online Submission:

Students are required to turn homework assignments **electronically** via the provided Carmen dropboxes by the dates/times listed on the course website for each assignment. In order to facilitate grading, **assignments must be submitted as either Microsoft Word documents or as PDF files.** Because the majority of assignments will require submitting Stata output, using Microsoft Word will usually be the optimal method for pasting in Stata code and output (using courier font), with potentially the need to resize the font to 10pt. Using Microsoft Word to write up assignments is encouraged, but not required. It is the student's responsibility to ensure that any hand-written problems that are scanned for submission as PDFs are clearly legible.

Homework/ Exam Scoring:

Clear and effective communication is crucial in statistical practice. This rule is applied to both homework and exams. In any problem-solving question it is the student's responsibility to make sure that he/she justifies his/her answer and provides enough detail for the grader to understand. Points may be deducted for answers that are not well-justified, even if they are correct.

Any questions regarding grading must be addressed **within one week** of the return of the homework or exams. No request of regrading on previous homework or exams will be accepted after the final exam except for the last homework and the final exam. As a general policy, when requested, the regrading will apply to the whole exam or the homework, not just to the specific part which the student thinks there might be a mistake. As a consequence, regrading may lead to a lower overall score. **Any questions regarding grading must be directed to the professor and not the TA**.

Disclaimer: This syllabus should be taken as a fairly reliable guide for the course content. However, you cannot claim any rights from it and in particular I reserve the right to change due dates or the methods of assessment. Official announcements will **always** be those posted on the course website (Carmen).

Copyright Disclaimer: The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

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.

Statement with COVID Process Addition

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. **SLDS contact information:** slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Disability Statement

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options for your specific needs. You are also welcome to register with Student Life Disability Services to establish reasonable accommodations. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. Please contact the Office of Student Life: Disability Services at 614-292-3307 (TDD: 614-292-0901) in room 098 Baker Hall (113 W. 12th Avenue) to coordinate reasonable accommodations for students with documented disabilities (https://slds.osu.edu). More resources regarding accessibility can be found at: https://ada.osu.edu/resources-0.

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 https://suicidepreventionlifeline.org.

Student Support

A recent American College Health Survey found stress, sleep problems, anxiety, depression, interpersonal concerns, death of a significant other and alcohol use among the top ten health impediments to academic performance. Students experiencing personal problems or situational crises during the semester are encouraged to contact OSU Counseling and Consultation Services (292-5766; http://ccs.osu.edu) for assistance, support and advocacy. This service is free to students and is confidential.

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 College'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 (http://oaa.osu.edu/coam.html). Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct*, the *Student Handbook*, and this syllabus 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. Ignorance of the *Code of Student Conduct* and the *Student Handbook* is never considered an "excuse" for academic misconduct, so I recommend that you review the *Code of Student Conduct* and the *Student Handbook*, specifically, the sections dealing with academic misconduct.

If I suspect a student of academic misconduct in this course, I am obligated by University Rules to report these suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this 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.

Artificial Intelligence and Academic Integrity

There has been a significant increase in the popularity and availability of a variety of generative artificial intelligence (AI) tools, including ChatGPT, Sudowrite and others. These tools will help shape the future of work, research, and technology but when used in the wrong way, they can stand in conflict with academic integrity at Ohio State.

All students have important obligations under the *Code of Student Conduct* to complete all academic and scholarly activities with fairness and honesty. Our professional students also have the responsibility to uphold the professional and ethical standards found in their respective academic honor codes. Specifically, students are not to use unauthorized assistance in the laboratory, on field work, in scholarship or on a course assignment unless such assistance has been authorized specifically by the course instructor. In addition, students are not to submit their work without acknowledging any word-for-word use and/or paraphrasing of writing, ideas or other work that is not your own. These requirements apply to all students undergraduate, graduate, and professional.

To maintain a culture of integrity and respect, these generative AI tools should not be used in the completion of course assignments unless an instructor for a given course specifically authorizes their use. Some instructors may approve of using generative AI tools in the academic setting for specific goals. However, these tools should be used only with the explicit and clear permission of each individual instructor, and then only in the ways allowed by the instructor.

Religious Beliefs or Practices Accommodations

It is Ohio State?s policy to reasonably accommodate the sincerely held religious beliefs and practices of all students. The policy permits a student to be absent for up to three days each academic semester for reasons of faith or religious or spiritual belief.

Students planning to use religious beliefs or practices accommodations for course requirements must inform the instructor in writing no later than 14 days after the course begins. The instructor is then responsible for scheduling an alternative time and date for the course requirement, which may be before or after the original time and date of the course requirement. These alternative accommodations will remain confidential. It is the student's responsibility to ensure that all course assignments are completed.

Anti-Racism Statement

The Ohio State University affirms the importance and value of diversity of people and ideas. We believe in creating equitable research opportunities for all students and to providing programs and curricula that allow our students to understand critical societal challenges from diverse perspectives and aspire to use research to promote sustainable solutions for all. We are committed to maintaining an inclusive community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among all members; and encourages each individual to strive to reach their own potential. The Ohio State University does not discriminate on the basis of age, ancestry, color, disability, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, race, religion, sex, gender, sexual orientation, pregnancy, protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment.

To learn more about diversity, equity, and inclusion and for opportunities to get involved, please visit:

- https://odi.osu.edu/
- https://odi.osu.edu/racial-justice-resources
- https://odi.osu.edu/focus-on-racial-justice
- http://mcc.osu.edu/

Copyright Disclaimer

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Statement on Title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at https://titleix.osu.edu or by contacting the Ohio State Title IX Coordinator, Melissa Mayhan, at titleix@osu.edu or 614-247-5838.

Course Calendar (*subject to change; most current version is always posted to Carmen*)

Dates	Week	Lectures	Assignments*	Learning Objectives
1/8 – 1/12	1	**Module 1: Review** 0A: Pearson's and Spearman Correlation 0B: Hypothesis Testing & Confidence Intervals 0C: Relationship between Correlation & SLR	Hwk–1 assigned	1, 2, 5
1/15 – 1/19	2	**Module 2: Simple Linear Regression I** 1A: Interpretation, Testing, Confidence Intervals 1B: R^2, Model Assumptions, Prediction Intervals **1/15 : NO CLASS – MLK Day**	Hwk–1 Due (1/18) Hwk–2 assigned	1, 2, 5
1/22 – 1/26	3	**Module 3: Simple Linear Regression II** 2A: ANOVA Table & Partial F-test 2B: Diagnostics		
1/29 – 2/2	4	**Module 4: Simple Linear Regression III** 3A: Intro to F-test and relationship with t-test, R^2 3B: Interpreting and testing with a binary predictor 3C: Coding a binary predictor, Relationship with two-sample t-test		
2/5 – 2/9	5	**Module 5: Multiple Linear Regression I** 4A: Interpretation, Testing, Model Assumptions, 4B: ANOVA Table, (partial) F-test, R^2, adjusted-R^2	Hwk–2 Due (2/8) Hwk–3 assigned	1, 2, 3, 4, 5
2/12 – 2/16	6	**Module 6: Multiple Linear Regression II** 5A: Interpretation & Testing with a Cat. Predictor 5B: Interactions: Continuous x Categorical., Cat. x Cat., Cont. x Cont.		
2/19 – 2/23	7	**Module 7: Multiple Linear Regression III** 6A: Assumption Checking, Multicollinearity	Hwk–3 Due (2/22)	
February 22		**MIDTERM EXAM 1**		
2/26 – 3/1	8	**Module 8: Multiple Linear Regression IV** 7A: Confounding 7B: Model Selection	Hwk–4 assigned	1, 2, 3, 4, 5
3/4 – 3/8	9	**Module 9: MLR cont'd + ANOVA** 8A: MLR – Outliers & Transformations 8B: ANOVA – One Way & Multiple Comparisons		
3/11 – 3/15	10	**NO CLASSES: SPRING BREAK**	Hwk–4 Due (3/14)	
3/18 – 3/22	11	**Module 10: Analysis Of Variance** 9A: ANOVA – Two Way	Hwk–5 assigned	6, 7
March 21		**MIDTERM EXAM 2**		
3/25 – 3/29	12	**Module 11: Analysis Of Variance Cont'd** 9B: ANOVA – Two Way continued	Hwk–5 Due (3/28)	
4/1 – 4/5	13	**Module 12: Non-Parametric Methods** 10A: Non-parametric Tests: Two Groups 10B: Non-parametric Tests: 3+ Groups	Hwk–6 assigned	6, 7, 8
4/8 – 4/12	14	**Module 13: Logistic Regression** 12A: Interpretation 12B: Testing	Hwk–6 Due (4/11) Hwk–7 assigned	9, 10
4/15 – 4/19	15	**Module 14: Survival Analysis** 13A: Introduction 13B: Testing	Hwk–7 Due (4/18)	
4/22 – 4/26	16	**Module 15: Finals Week** 14A: Review Session		
April 25		**FINAL EXAM, Time TBD**		

*All homework (Hwk) assignments are due at **11:59pm EST on the due dates** that will be announced in-class or on Carmen.

*Optional readings corresponding to each lecture (from a textbook) will be provided in class and/or posted on the Carmen site.

SLR = Simple Linear Regression; MLR = Multiple Linear Regression
Bin. = Binary; Cat. = Categorical; Cont. = Continuous

Alignment of Course Assessments with Degree Program Competencies

	Homework	Midterm Exam 1	Midterm Exam 2	Final Exam
Foundational MPH Competencies				
Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate (3)	x			
Interpret results of data analysis for public health research, policy or practice (4)	x	x	x	x
MPH-Biostatistics Specialization Competencies				
Address problems arising in public health and medicine through appropriate statements of hypotheses, study design, data collection, data management, statistical analysis, and interpretation of results (1)	x	x	x	x
Describe basic concepts of probability, random variation and commonly used statistical probability distributions (4)	x	x	x	x
Use computational methods to effectively analyze complex public health and medical data (5)	x			
MS-Biostatistics Specialization Competencies				
Address problems arising in public health and medicine through appropriate statements of hypotheses, study design, data collection, data management, statistical analysis, and interpretation of results (7)	x	x	x	x
Explain core concepts of probability, random variation and commonly used statistical probability distributions and how they relate to statistical inference (9)	x	x	x	x
Use computational methods to effectively analyze complex public health and medical data (10)	x			

The Ohio State University College of Public Health

Design and Analysis of Clinical Trials
PUBHBIO 7215: 2 credit hours – Autumn, 2023

Instructor:
Abigail B. Shoben, Ph.D.
Email: shoben.1@osu.edu
Office: 249 Cunz Hall
Phone: 614-247-8092

Class Meetings: Tuesdays, 11:45am–1:35pm, Cunz Hall 230

Office Hours: Fridays, 2:00pm–3:00pm, Zoom or by appointment

Course Description: Design, monitoring, and analysis of clinical trials; includes protocol development, randomization schemes, sample size methods, and ethical issues.

Prerequisites: PUBHLTH 6001, PUBHBIO 6210, or STAT 5301 or instructor permission.

Reference Text: Available as **FREE** electronic resource through Springer Link:

- Friedman, Furberg, DeMets, Reboussin, & Granger. *Fundamentals of Clinical Trials*, 5th Edition.

Class Format: In class lecture and class discussion. In the unexpected event class cannot meet in person, assume that we will meet on zoom at the same time. An announcement will be made via Carmen in this scenario

Course Notes: Posted on Carmen prior to each lecture.

Carmen: There is a Carmen site for this course: `http://carmen.osu.edu`
All course material will be posted to Carmen.

TA: Ruochen Zhao (zhao.3005@buckeyemail.osu.edu)

TA Responsibilities: The TA assigned to the course may assist during class sessions. The TA may assist with scoring homework and exams; however, final grades will be assigned by the professor. Any questions regarding grading should be directed to the professor and not the TA.

Required Software:

Statistical software (student choice)
Some use of a statistical software package of your choice (e.g., Stata, R, SAS) is required. In class examples and homework keys will use Stata. Information about Stata purchase for students is available at `https://www.stata.com/order/new/edu/profplus/student-pricing/`.

Basic calculator

Students should have access to a scientific calculator that can perform basic arithmetic, square roots, logarithms, and exponentiation. For this online class, a program such as Microsoft Excel may suffice.

Microsoft Office 365

All Ohio State students are now eligible for free Microsoft Office 365. Full instructions for downloading and installation can be found at `go.osu.edu/office365help`.

Learning Objectives

Upon successful completion of the course, students will be able to:

1. Identify sources of random and systematic error (bias) in clinical trials
2. Describe common designs used in clinical trials
3. Use appropriate methods of randomization and blinding in the design of clinical trials.
4. Calculate appropriate sample sizes for sufficient power in common clinical trial designs
5. Identify the issues associated with common design decisions such as blinding, inclusion / exclusion criteria, and interim analyses.
6. Determine an appropriate outcome measure for a trial, given various scientific settings.
7. Describe common ethical issues present in clinical trials, such as informed consent and placebo control

Interdisciplinary PhD Program in Biostatistics Learning Goals

1. Understands the theoretical foundations of statistical methods (1)
2. Critique general scientific research articles and assess the appropriateness of the statistical applications and methodology involved (2)
3. Can work effectively and collaboratively in a team on a biological or health-related scientific question (3)
4. Can design biological or health-related research studies and construct and implement statistical analysis plans appropriate for such studies (4)

MS-BIO Specialization Competencies:

- Address problems arising in public health and medicine through appropriate statements of hypotheses, study design, data collection, data management, statistical analysis, and interpretation of results (7)
- Recognize strengths and weaknesses of study designs, data sources, and analytic methods (8)

MPH-BIO Specialization Competencies:

- Recognize strengths and weaknesses of study designs and data sources commonly encountered in public health (2)
- Identify strengths and weaknesses of standard analytic methods (3)
- Address problems arising in public health and medicine through appropriate statements of hypotheses, study design, data collection, data management, statistical analysis, and interpretation of results (7

Course Outline: *Subject to change*

Date	Topics	Activity
8/22	Introduction, what are clinical trials	lecture
8/29	General framework	lecture
9/5	Outcome selection	lecture & mock review
9/12	Sample size and power	lecture & mock review
9/19	Randomization and blinding	lecture & mock review
9/26	Bias in clinical trials	lecture & mock review
10/3	Population effect summaries	lecture & mock review
10/10	Intercurrent events	lecture & mock review
10/17	Multiple testing	lecture & mock review
10/24	Interim analyses	lecture & mock review
10/31	Subgroup analysis	lecture & mock review
11/7	No Class (midterm due 11/9)	
11/14	Early stage designs	lecture & mock review
11/21	Late stage designs	lecture & mock review
11/28	Ethical issues	lecture & mock review
12/5	Wrap up	lecture & in class activity
	Final exam due 12/11	

Tentative HW due dates: 9/4, 9/18, 10/2, 10/16, 10/30, 11/27

Grading: Final class grade will be determined as follows:

30%	Homework
20%	Mock trial & Class participation
25%	Midterm exam
25%	Final exam

Any questions regarding the grading should be addressed **within one week** of the return of the homework or exam. As a general policy, when requested, the regrading will apply to the whole exam or the homework, not just to the specific part which the student thinks there might be a mistake.

Grading Scale:*

		87–89	B+	77–79	C+				
93–100	A	83–86	B	73–76	C	60–69	D	≤ 59	E
90–92	A-	80–82	B-	70–72	C-				

**The instructor reserves the right to adjust the grading scale if it appears necessary due to overall class performance. These adjustments will only raise a student's grade, not lower it.*

Mock Trial Reviews: Most class periods will include a mock trial review of an actual published trial. During the mock review, a group of 3-5 students will prepare and act as the research team proposing the trial or defending the results (the "investigators") and the rest of the class will prepare questions for the team to answer based on the proposed design or results (the "peer reviewers"). Students serving as the investigators are encouraged to plan ahead for who will be expert in various areas (e.g., statistics, outcome selection, general design, etc). Students serving as reviewers are expected to prepare appropriate questions for the investigators to answer. The reviewers **must** submit 3 potential questions to the instructor via Carmen before the class period in which the review is held, although reviewers are permitted to ask questions that were not submitted ahead of time. Reviewers submitting questions but not asking one in class, or asking a question in class but not submitting ahead of time, will receive half credit. The lowest two peer reviewer scores will be dropped when computing the final grade. All students will serve as investigators twice during the semester with two different groups.

Midterm and Final Exams : Both the midterm and the final exam will be take home exams. The midterm will be due on Thurdsay, 11/9 and the final is due on 12/11. The midterm questions will primarily revolve around crique of published articles and the final will be a mix of article critique and general clinical trial design and analysis.

Exams must be completed without the help of other individuals, but books and notes are okay.

Late exams will not be accepted. Students who fail to submit an exam by the due date will receive a zero in the absence of a documented excuse.

Class Participation: As this class includes multiple activities in which students must be active participants, it is expected that all students will regularly attend class and participate fully. Students anticipating more than sporadic absence (>2 class days) should discuss their situation with the instructor as soon as possible.

Online Submission: Students are required to turn in all written assignments **electronically** via Carmen by the dates/times listed on the course website for each assignment. In order to facilitate grading, **assignments must be submitted as either Microsoft Word documents or as PDF files.** It is the student's responsibility to ensure that any hand-written problems that are scanned for submission as PDFs are clearly legible.

Late Work: Due to their necessity for a properly-functioning class period, submission of mock review questions will be accepted until the start of the corresponding class period and will be scaled to 75% of the earned score. Submissions after the start of the class period will receive no credit. Late homework will be scaled to 75% and 50% of the earned score if submitted up to 24 or 48 hours late, respectively (including weekends, holidays, etc.). Beyond 48 hours, no credit will be given. All students may turn in one homework up to 24 hours late with no penalty and with no need to contact the instructor.

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Alignment of Course Assessments with Degree Program Competencies

	Mock Trial Reviews	Homeworks	Midterm	Final
Interdisciplinary PhD in Biostatistics Learning Goals				
Understands the theoretical foundations of statistical methods (1)		✓		✓
Can critique general scientific research articles and assess the appropriateness of the statistical applications and methodology involved (2)	✓	✓	✓	
Can work effectively and collaboratively in a team on a biological or health-related scientific question (3)	✓			
Can design biological or health-related research studies and construct and implement statistical analysis plans appropriate for such studies (4)		✓		✓
MS-Biostatistics Specialization Competencies				
Address problems arising in public health and medicine through appropriate statements of hypotheses, study design, data collection, data management, statistical analysis, and interpretation of results (7)		✓		✓
Recognize strengths and weaknesses of study designs, data sources, and analytic methods (8)	✓	✓	✓	✓
MPH-Biostatistics Specialization Competencies				
Address problems arising in public health and medicine through appropriate statements of hypotheses, study design, data collection, data management, statistical analysis, and interpretation of results (1)		✓		✓
Recognize strengths and weaknesses of study designs and data sources commonly encountered in public health (2)	✓	✓	✓	✓
Identify strengths and weaknesses of standard analytic methods (3)	✓	✓	✓	✓

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 the syllabi for hteir courses may constitute "Academic Misconduct."

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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 this 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 the me.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Office of Student Life: Disability Services / COVID-related accommodations

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process (`(slds.osu.edu/covid-19-info/covid-related-accommodation-requests/`), managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let the instructor know immediately so that we can privately discuss options. To establish reasonable accommodations, the instructor may request that you register with Student Life Disability Services. After registration, make arrangements with the instructor as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; `slds.osu.edu`; 098 Baker Hall, 113 W. 12th Avenue.

Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

Online: `equity.osu.edu`
Phone: 614-247-5838 or TTY 614-688-8605
Email: equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.

The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

CCAMPIS Program

The Office of Diversity and Inclusion provides holistic support for qualifying student parents enrolled at Ohio State. To learn more, contact the "Child Care Access Means Parents in School" (CCAMPIS) Program at 614-247-7092, lewis.40@osu.edu, or visit `http://odi.osu.edu/ccampis`.

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 `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`.

PUBHHBP 6535: Course Syllabus

Community Engagement/Collaborative Community Problem-Solving

Fall 2023, August 22-December 6

David A. Julian, Ph.D.
julian.3@osu.edu
614-292-5046

Melissa Ross, Psy.D.
ross.565@osu.edu
614-292-0175

Course Description

In recent years, there has been a growing emphasis on collaborative problem-solving relative to a variety of public health issues. Community collaborations have been convened to address issues such as substance abuse, children's mental health, and health disparities. Such collaborations typically include a variety of participants including representatives of government agencies, service providers, and charitable organizations. Involvement of members of the community is often a critical issue. It is likely that public health professionals will increasingly be called upon to participate in and perhaps even manage such collaborative, problem-solving efforts. Students will have the opportunity to review a broad range of literature, concepts, tools, and procedures related to community engagement and collaborative problem-solving.

Course Objectives

1. Define and use terminology consistent with the concepts of community engagement and collaborative community problem-solving.
2. Differentiate collaboration from other partnership arrangements or problem-solving processes and define why collaboration is an appropriate approach to specific public health issues.
3. Identify and articulate the value of specific roles in the collaborative community problem-solving process.
4. Judge the effectiveness of specific procedures and tools that support collaborative community problem-solving.
5. Determine appropriate options for involving community members in the community problem-solving process.

Public Health Competencies (see Attachment A)

Attachment A addresses linkages between class sessions, learning objectives, public health knowledge areas, core competencies, and specialization competencies.

Foundational Public Health Knowledge: This course will address foundational, public health knowledge and by addressing the social, political, and economic determinants of health and health inequalities.

MPH Foundational Competencies: This course will address several foundational competencies. Course content will support students' efforts to 1) understand the means by which structural bias, social inequalities, and racism undermine health and create challenges to achieving health equity at organizational, community, and societal levels; 2) apply awareness of cultural values and practices to design and/or implement public health policies or programs; 3) apply principles of leadership, governance, and management which include creating a vision, empowering others, fostering collaboration, and guiding decision-making; and 4) perform effectively on inter-professional teams.

MPH-PEP Specialization Competencies: This course will address several specialization competencies and support students' efforts to examine methods of community engagement to inform/address population health interventions and use multiple methods and sources to seek comprehensive information and apply evidence-based, decision-making techniques to understand population health concerns and programs.

Class Format

This class is a 100% online, distance course. An overview of course content is included in Attachment B. The course content is hosted on OSU's Carmen Canvas learning management system. Course content is divided into several, distinct modules that can be found in the Modules tab of the Canvas course:

- Module 1: Getting Started and Introduction to Basic Concepts
- Module 2: Professional Roles
- Module 3: Values and Community Engaged Problem-solving
- Module 4: Community Engagement Tools
- Module 5: Citizen Participation
- Module 6: Power and Influence

Each module consists of several basic components:

1. Video
2. Readings
3. Lecture
4. Knowledge Check
5. Voluntary Virtual Meet-Up

Students are expected to access the materials associated with each module and review and understand course content. Each module is devoted to a particular topic and is supported by a specific set of readings. All required materials including readings for each module are indicated and available through Canvas.

Readings and Videos

Reading assignments are available on-line. There is no text for this class. Additional readings may be distributed electronically and/or through the Health Sciences Library. The instructor reserves the right to add and/or modify the required readings, videos, and/or other course materials. Required videos are available on-line.

Lecture and Content Slides

Each module will be accompanied by a short lecture and content slides. Lectures will be presented synchronously and will be recorded. Students can participate in the synchronous lecture and/or view the recording. Dates for the lectures are indicated in Attachment C in the Course Schedule.

Knowledge Checks

Students will be required to complete six, on-line Knowledge Checks (quizzes) associated with course materials. See "Attendance, grading and Total Points" for additional information.

Voluntary Virtual Meet-Ups and Office Hours

Students will also have the opportunity to meet virtually to discuss relevant materials. These meetings (called Virtual Meet-Ups) are voluntary but are the primary mechanism through which students can ask questions and clarify content. Dates for voluntary Virtual Meet-Ups are indicated in the Course Schedule (Attachment C). The instructor will be available during these times to answer questions and/or address specific concerns. Issues and problems should be identified and shared during these time periods. If such discussion is not sufficient to address recognized issues, students should arrange a time to meet with the instructor. This is best accomplished by sending an email to the instructor at julian.3@osu.edu.

Optional Resources

The resources indicated below provide detailed explanations of some of the concepts we will review in class. These resources can be accessed at your discretion and are meant to supplement course materials.

- APA style guidelines can be accessed at, https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/general_format.html.
- Progressive activism at progov21.org
- Community Tool Box at www.http.ctb.ku.edu/en/
- Community Science at www.senseofcommunity.com
- Tamarack Institute at http://www.tamarackcommunity.ca/library
- Society for Community Research and Action at www.scra27.org
- Planning and other practical information at www.prevention.samhsa.gov/about/spf.aspx

- *The Deliberate Practitioner: Encouraging Participatory Planning*-John Forester

Attendance, Grading, and Total Points

There are no mid-terms or final exams in this course. Course performance will be based on performance on Knowledge Checks. Knowledge checks consist of 10 multiple choice questions for each module/session. Each question is worth 2 points. Students can accumulate a total of 120 points. Occasionally, a student may select a response to a Knowledge Check question that is judged to be incorrect or not consistent with course content.

In such cases, the student has the option of writing a brief (no more than half a page) argument for why her/his answer choice is appropriate or why the instructor's choice is the best response. If a student elects this option she/he will be awarded the full 2-points for the question or partial credit (1 point) based on the instructor's judgement. This policy applies to up to two (2) questions on each Knowledge Check. Due to time constraints, this policy will not apply to the Knowledge Check for Module 6.

Successful performance in this class depends on adequate student preparation. Total points are indicated below.

Activity	Points
Knowledge Check for Module 1	20
Knowledge Check for Module 2	20
Knowledge Check for Module 3	20
Knowledge Check for Module 4	20
Knowledge Check for Module 5	20
Knowledge Check for Module 6	20
Total Points	120

Grades will be assigned according to the following criteria:

- (A)=94-100% of total points: Outstanding performance/Mastery of course concepts
- (A-)=90-93% of total points: Outstanding performance/Mastery of most course concepts
- (B+)=87-89% of total points: Very good performance/Mastery of some course concepts
- (B)=83-86% of total points: Good performance/Mastery of some course concepts
- (B-)=80-82% of total points: Good performance/Mastery of some course concepts
- (C+)=77-79% of total points: Mediocre performance/Mastery of a few course concepts
- (C)=73-76% of total points: Mediocre performance/Familiarity with some course concepts
- (C-)=70-72% of total points: Mediocre performance/Little familiarity with course concepts

Office of Student Life-Disability Services

Any student who feels she/he may need an accommodation based on the impact of a disability should contact the instructor privately to discuss specific needs. Students should contact the Office of Student Life-Disability Services at 614-292-3307 in Room 098, Baker Hall 113, W.

12th Avenue to coordinate reasonable accommodations for documented disabilities (http://www.ods.ohio-state.edu/).

Mental Health Services

Students 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. Such 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 with addressing these and other concerns students may experience. If you or someone you know is suffering from any of the these conditions, you can learn more about the broad range of confidential, mental health services available on campus via the Office of Student Life Counseling and Consultation Services (CCS) by visiting ccs.osu.edu or calling 614-292-5766. Counseling and Consultation Services (CCS) is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. Students may be able to 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, College of Public Health and Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct* and the School's *Student Handbook* and will complete all academic and scholarly assignments with fairness and honesty. Information on academic integrity and academic misconduct can be found on the COAM web pages (http://oaa.osu.edu/coam/home.html). Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and the syllabi for their courses constitutes 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/or 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 was printed material.

Further examples are found in the *Student Handbook*. Ignorance of the *Code of Student Conduct* and *Student Handbook* is never considered an "excuse" for academic misconduct. If the instructor suspects a student of academic misconduct in a course, she/he is 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/or suspension or dismissal from the University. If you have any questions about this policy or what constitutes academic misconduct in this course, please contact the instructor.

Tech Support and Reporting a Problem with Canvas

There are a variety of campus resources available to assist with technology issues. Please see "General Tech Support and Reporting a Problem with Canvas" in your course resources.

- Self-service and chat support: http://ocio.osu.edu/selfservice
- Phone: 614-688-HELP (4357)
- Email: 8help@osu.edu
- TDD: 614-688-8743

Attachment A: Relationship of Course Content to Public Health Competencies

Topic/Session/Module	Learning Objective	Knowledge Area	Competencies	
Session1: Basic Concepts	Define collaboration community problem-solving and related topics. Differentiate collaboration from other forms of partnership and consider application to public health issues.	Social, political, and economic determinants of health and health inequalities	1a./2a.	3b.
Session 2: Professional Roles	Identify and articulate specific roles in collaborative community problem-solving.	Methods and tools; Leadership and team-building	2c.	3b.
Session 3: Values & Community Engaged Problem-solving	Articulate the values underlying community engagement.	Methods and tools; Leadership and team-building	2c.	3b.
Session 4: Community Engagement Tools	Judge effectiveness of specific procedures and tools.	Methods and tools	2d.	3b.
Session 5: Citizen Participation	Determine appropriate options for involving members of the community in the problem-solving process.	Methods and tools	2d.	3b.
Session 6: Power and Influence	Identify models and approaches for shifting power and influence to the community.	Cultural values and practices	2b.	3a.

Attachment B: Course Outline and Guiding Content Questions

1. Module 1: Introduction to Basic Concepts

   What are the characteristics of a healthy community?;What are the characteristics of typical public health problems?; Is collaborative problem-solving a reasonable response to PH issues?; What is community engagement?; What is a coalition and how might coalitions function to promote well-being?; What is collaboration, collaborative capacity, and collaborative community problem-solving?; What does income inequality have to do with solving problems in communities?

2. Module 2: Professional Roles/Community Engaged Public Health Practice

   What is structural inequality and how does it relate to public health issues?; What is community practice and what are potential roles of PH professionals?; How does community practice relate to public health problem-solving?; What are some models for practicing at the community level?; What is project management and is it a PH competency?; What is collaborative community problem-solving?; What competencies are necessary to practice at the community level?

3. Module 3: Values Guiding Community Engaged Problem-solving/Community Engaged Problem-solving in Comparison to Other Approaches

   What is a value and how do values influence practice?; How is social justice related to desired PH outcomes?; What other values might guide community engaged problem-solving?; How do values including social justice inform work with specific populations?

4. Module 4: Community Engagement Tools/Tools and Techniques to Foster Community Engaged Problem-solving

   What is a community engagement tool?; What are some examples of tools?;How do such tools work?; What is the professional role relative to the application of tools?

5. Module 5: Citizen Participation/Citizen Involvement

   Why is participation in problem-solving desirable?; How might various forms of participation be characterized?; What types of mechanisms are available to support citizen participation?; What are relevant professional roles in promoting citizen participation?

6. Module 6: Power and Influence/Power and Influence and PH Practice

   What is power?; What theories explain power?; How is power related to public health outcomes?

Attachment C: Course Schedule PUBHHBP 6535

Module	Date and Time			
	Module Open	Voluntary Lecture/Meet-up 6:30-8:30 pm	Date to Turn-In Knowledge Check	Knowledge Check-Corrections Due
Module 1	Aug. 15	Aug. 22	Sept. 6	Sept. 13
Module 2	Aug. 29	Sept. 12	Sept. 15	Sept. 20
Module 3	Sept. 12	Oct. 3	Oct. 6	Oct. 11
Module 4	Oct. 3	Oct. 24	Oct. 27	Nov. 1
Module 5	Oct. 24	Nov. 14	Nov. 17	Nov. 22
Module 6	Nov. 14	Dec. 5	Dec. 8	NA

THE OHIO STATE UNIVERSITY
COLLEGE OF SOCIAL WORK

SWK8406: Mixed Methods Research in Social and Health Sciences

Instructor:
Arati Maleku, Ph.D.
Maleku.1@osu.edu

Term: Autumn 2023

Location : Synchronous Online (Zoom & 425V)

Virtual Office Hours: By appointment

Class Meeting:
Thursdays 2:00 pm— 4:45 pm

Level of Instruction & Credit Hours: Ph.D. Level, 3 credits

Prerequisites: Doctoral social work program students in good standing and have successfully completed quantitative and qualitative research methods courses (SWK 8401 and SWK8402). Other doctoral-level graduate students in good standing may enroll in the course with permission from the instructor.

COURSE DESCRIPTION

Given the increasing need for methodological sophistication and diversity to understand and address the complex nature of social and health problems, there is a continual need to develop new methodologies to improve the scientific power of both quantitative and qualitative data. This interest has contributed to the increasing demand for using mixed methods research to better understand social and health problems. SWK 8406 is designed to help students appreciate the scientific approach of building practice and research knowledge using mixed methods research approaches, including applying and integrating these approaches across different stages of the research process.

This course will provide an overview of the mixed methods approach, emphasizing its application in social and health sciences research. The course will begin with a discussion of the history and philosophy of mixed methods research and will maintain a focus on the epistemological underpinnings of both mixed methods designs and their components. Consideration will be given to a number of research traditions that can be incorporated under quantitative and qualitative methods, including epidemiological surveys, in-depth qualitative interviewing, focus groups, ethnography, social network analysis, measurement development/psychometrics, and Geographic Information Systems (GIS).

Special emphasis will be given to ensure that students develop an understanding of health equity and disparities research, as well as community-based participatory research (CBPR) approaches to conduct mixed methods research. Students will learn how mixed methods can increase the ability and rigor to address research questions about what puts people at risk in the

first place and the need for a multidisciplinary lens to highlight the complexity of problems faced by social work and public health disciplines. The course will draw examples from scholars across the translation continuum methods of incorporating both quantitative and qualitative data, and integration of findings to better understand and address the unique needs of culturally diverse populations including, but not limited to, race, ethnicity, social class, gender, transgender, orientation, age, disability and migration status. Divided into five specific modules, the course will provide a beginning introduction to the evolving nature of mixed methods research and the centering of ways to integrate qualitative and quantitative data through all phases of a research project. This course will help prepare doctoral students to set the stage for a more advanced mixed methods research trajectory.

SPECIFIC COURSE GOALS

Through this course, students will develop the requisite skills and knowledge to understand, critique, and apply conceptual strategies and practical techniques to conceptualize, plan, design, and conduct a mixed methods research study and utilize the results to address the research question and engage stakeholders. Students will enhance their ability to formulate research questions, choose the appropriate mixed methods designs and data collection techniques, as well as analyze and interpret mixed method research results. Methods for collecting, analyzing, integrating, and reporting data from multiple sources will also be discussed. The course will have an applied focus and will include lectures- virtual and in-class, presentations of applied mixed methods research by guest experts, applied and methodological readings, and student presentations. Upon satisfactory completion of this course, students will be able to:

1) Demonstrate familiarity and develop students' ability to critically analyze and understand conceptual issues shaping and impacting mixed methods research with regard to epistemological and philosophical underpinnings.
2) Understand the major steps involved in conceptualizing, planning, and implementing a mixed methods research study with a specific focus on understanding the major types of mixed method research designs.
3) Explain the major steps involved in data validation and data interpretation with a specific focus on designing validity designs applicable for mixed methods research;
4) Understand the major steps involved in facilitating the integration of quantitative and qualitative research approaches at each stage of the mixed methods research process
5) Critically analyze mixed methods research study and major steps involved in utilizing mixed methods research findings and conclusions with a specific focus on dissemination to stakeholders;
6) Understand the role of ethical conduct of research in designing a mixed methods research study across culturally diverse populations.

Course Evaluation by Students

Students will use the online Student Evaluation of Instruction (SEI) mechanism to evaluate the course.

University, College, and Course Policies

The university maintains policies regarding the conduct of courses and your academic experience at Ohio State. It is your responsibility as a student to review and be aware of these policies. The links to these policies are below:

University Policies

- Disability Statement
- Excused Absence Guidelines
- Academic Misconduct
- Grievances and Solving Problems
- Creating an environment free from harassment, discrimination, and sexual misconduct
- Diversity Statement
- Counseling and Consultation Services / Mental health statement
- Content warning language
- Copyright
- Lyft Ride Smart
- Graduate School Handbook

College of Social Work Policies

- Attendance Policy
- Incomplete Policy
- COVID-19 Related Safety Expectations for Students in In-Person Classes
- Recommended Technology Support

TEXT BOOKS & ANCILLARY MATERIALS

Required Text

Creswell, J. W. (2015). *A concise introduction to mixed methods research*. Sage Publications, Inc.

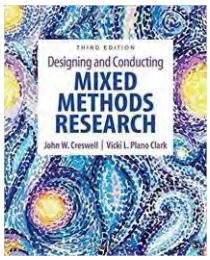
This will serve as the required text book throughout the course. We will be referring to this book very often in class. We will often cover multiple chapters a week and set a very steady pace throughout the semester.

Watkins, D., & Gioia, D. (2015). *Mixed Methods Research*. New York: Oxford University Press.

This will serve as the second required text book for this course as this book nests mixed methods research squarely within the social work domain. Grounded in social work research, this book will contribute to the larger interdisciplinary discussion about mixed methods research within and beyond social work.

Suggested Resources

Curry, L., & M. Nunez-Smith (2015). *Mixed Methods in Health Sciences Research: A Practical Primer*. Sage Publications.
Through real-world examples, helpful checklists, figures, tables and templates, this book provides many examples that will strengthen the quality of mixed methods research, facilitate communication about methods, and improve efficiency over the course of mixed methods research projects.



Creswell, J.W. & Plano Clark, V.L. (2017). *Designing and Conducting Mixed Methods Research, 3rd ed.* Thousand Oaks, CA: Sage Publications.
This book covers detailed description of seven mixed methods designs with accompanying journal articles illustrating each design. This new edition includes information about the dynamic and evolving nature of the field of mixed methods research, four additional methodological approaches, and coverage of new directions in mixed methods.

Recommended Resources

Creamer, E. G. (2018). *An Introduction to Fully Integrated Mixed Method Research.* Thousand Oaks, CA: Sage Publications.
This is a great resource for novice mixed methods researchers to design, execute and evaluate a mixed methods research study. We will be referring to this book for its deeper discussion around integration of qualitative and quantitative data.

Hacker, K. (2013). *Community-Based Participatory Research.*
Thousand Oaks, CA: SAGE Publications.
This is an easy-to-read introduction to Community-Based Participatory Research, which will thoroughly complement the mixed methods course. The CBPR discussion will seek to
improve the relevancy and acceptability of mixed methods research in a pragmatic way.

Supplemental Material

American Psychological Association. (2020). *Publication Manual of the American Psychological Association (7th ed.)*. Washington, DC: Author.
This book is extremely useful for academic writing. Please be advised that all the writing assignments for this course and any other social work course follow the APA 7th edition format.

Course Components & Method of Instruction

Much of what students learn in the classroom is affected by two sources: the level of effort contributed by the individual, and the learning community that is created through the shared ownership and contributions of the collective whole. Please note that this course will meet online. Everyone is asked to participate to her/his fullest extent in the virtual learning environment to facilitate others' ability to participate at the same time. This means that we come prepared to join in the virtual classroom learning experience by having our readings and other work completed, we respect ourselves and others, and we take responsibility for completing assignments in a competent and timely manner, but much more than this, it also means that we each take a shared responsibility for the growth and professional development of each of the individuals in our learning community. The course components for this course have been designed with these ideas in mind.

This course is designed in a team-based learning format using small groups that provides opportunities for small teams to engage in learning tasks. Virtual teaching methods will include class discussions and brief lectures around assigned readings, guest speakers, experiential learning through in-class exercises, individual and written assignments, audio and video clips and lectures before class session and student presentations.

Instruction methods: Both in-person and virtual lectures will be offered throughout the semester that will include review and explanation of course materials and elaboration of some relevant social work topics. A combination of power point presentations, discussions, audio-visual aids, guest lectures, and in-class exercises will be used to teach major concepts while adapting to different student learning styles. Every class will start with a quick recap of the previous class.

Faculty and Student Interaction: This course is designed to facilitate substantive discourse, engagement, and interaction between the instructor and students. The instructor will provide weekly interaction/feedback via weekly Carmen facilitated discussions/assignments, announcements, virtual office hours, scheduled Zoom sessions. Instructor-student interaction occurs at a minimum, weekly and is designed to be initiated by either.

Major Assignments: There are 2 major written assignments, 4 short online quizzes and 2 virtual presentations throughout the semester. Please refer to the assignment guidelines on the appendix section of the syllabus and the assignment and grading criteria for more information on assignments.

Optional assignment drafts: Optional drafts of assignments can be submitted to the instructors for feedback. Please refer to the course calendar for the optional draft due dates. We encourage students to take this opportunity to submit draft assignments for effective learning process.

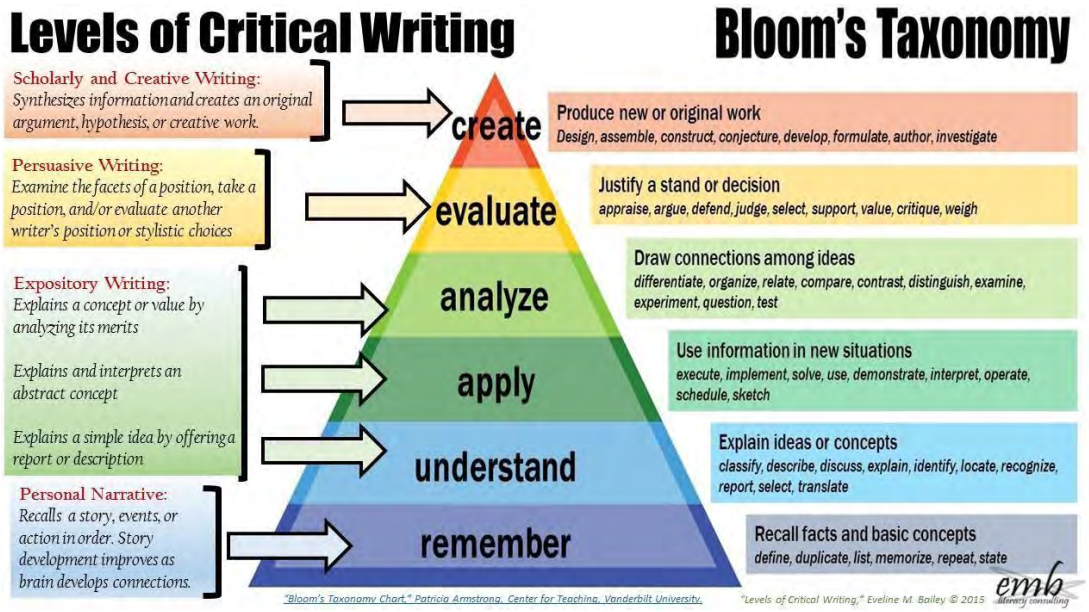
Carmen: The Carmen platform will be used throughout the semester as an online resource, repository of course materials, assignment submission portal, and any other course related issues. It can be accessed from: https://carmen.osu.edu/

Course Expectations

- Students are expected to meet via zoom and attend virtual class on time and remaining for the full class period. Students who are unable to attend are expected to contact instructor via email prior to class.
- Students are expected to read assigned materials and come to class prepared to demonstrate knowledge and understanding of the concepts, principles and background information reflected in the course outline.
- Verbal participation in class is expected, encouraged, and supported. It is expected that opinions expressed by all students will be heard and respected by all class participants.
- All electronic devices will be turned off during class time to avoid disrupting the class session, unless they are being utilized for class projects.
- Honesty and academic integrity are held as high values. Any violations will be dealt with according to university policies and procedures.
- Independent thinking, creativity in assignments and intellectual risk taking are encouraged.
- All assignments submitted for evaluation are expected to be on time and original scholarship. Students who are unable to meet assignment deadlines are expected to contact instructor prior to due date to make alternative arrangements. Changes in the course schedule or assignments may be made at the discretion of the instructors.

GRADING POLICY

Grading on all written assignments will be based on the format (proper APA formatting), demonstration of critical thinking, and fulfillment of all the assignment based on the instructions and guidelines outlined under each assignment. Critical thinking should be demonstrated as identified in Bloom's taxonomy through the six levels (see figure below).



The final grade assigned for the course should reflect the student's overall performance in the course as described by the following points. Please refer to the assignment guidelines for detailed instructions on the assignments.

Summary of points for assignments

Assignments	Total Points	Due Dates
Lightning Talks	10	9/14/23
Online Quizzes (4x10 points)	40	End of each module Quizzes Available until 11/30/23
Letter of Intent for a Grant using Mixed Methods Research	15	10/19/23
Virtual presentation of your Mixed Methods Research Proposal	10	11/30/23
Final Paper: Grant Proposal using Mixed Methods Research	25	12/1/23
Total Points	**100**	

The course grading scale follows the OSU standard grading scheme:

A = 93-100%	B+ = 87-89%	C+ = 77-79%	D+ = 67-69%
A- = 90-92%	B = 83-86%	C = 73-76%	D = 60-66%
	B- = 80-82%	C- = 70-72%	E = 0-59%

COURSE CALENDER

Module I: The Context of Mixed Methods

This module aims to introduce students to the context of mixed methods research. This includes an overview and introduction to provide a perspective and understanding of integrated methodology. We will introduce various aspects of mixed-methods research and rigorous mixed-methods studies using interdisciplinary conceptual papers and research studies.

Objectives:

- Review and explain the history and ethics of mixed methods research.
- Illustrate the role of paradigms and theories to highlight the utility of mixed methods research in social and health sciences.

Session	Agenda	Readings	Assignments
Session 1 **8/24/23**	• Welcome & Introductions • Syllabus & Course Overview • Overview & Background o Ethics, Values & Mixed Methods Research	Landau, R. (2008). Social work research ethics: Dual roles and boundary issues. *Families in Society: The Journal of Contemporary Social Services, 89*(4), 571-577. Stadnick, N.A., Poth, C.N., Guetterman, T.C. & Gallo, J.J. (2021). Advancing discussion of ethics in mixed methods health services research. *BMC Health Serv Res 21*, 577 (2021)	Review video: Ethical issues when conducting mixed methods research
Session 2 **8/31/23**	• A "Mixed" Way of thinking • Theory Discussion: Paradigm for Mixed Methods Research	Watkins, D., & Gioia, D. (2015). *Mixed Methods Research*. New York: Oxford University Press. First Floor: An Introduction to a "Mixed" Way of Thinking (pp 1-16). Shannon-Baker, P. (2016). Making paradigms meaningful in mixed methods research. *Journal of Mixed Methods Research, 10*(4), 319-334. Onwuegbuzie, A.J. & Leech, N.L. (2005). On becoming a pragmatic researcher: The importance of combining quantitative and qualitative research methodologies. *International Journal of Social Research Methodology, 8*(5), 375-387. Johnson, R.B (2017). Dialectical pluralism: A meta paradigm whose time has come. *Journal of Mixed Methods Research, 11*(2), 156-173.	

		Mertens, D. M. (2003). Mixed models and the politics of human research: The transformative-emancipatory perspective. In A. Tashakkori & C. Teddlie (Eds.), Handbook of mixed methods in social & behavioral research (pp. 135-166). Thousand Oaks, CA: Sage. See Carmen: Pragmatism as a paradigm for mixed methods research	
Session 3 **9/7/23**	Introduction to Mixed Methods Research • What is Mixed Methods? • Why do Mixed Methods Research?	Creswell, J. W. (2015). A Concise Introduction to Mixed Methods Research. Sage Publications, Inc. Chapter 1: Basic Features of Mixed Methods Research Curry, L., & M. Nunez-Smith (2015). Mixed Methods in Health Sciences Research: A Practical Primer. Sage Publications, Inc. Chapter 10: Implementation Issues in Mixed Methods Research. Maxwell, J. A. (2016). Expanding the history and range of mixed methods research. Journal of Mixed Methods Research, 10(1), 12-27. Fetters, M. D. (2016). "Haven't We Always Been Doing Mixed Methods Research?" Lessons Learned from the Development of the Horseless Carriage.	Refer to Carmen Resources: Review Quantitative and Qualitative Research **Quiz 1 Due by end of Module I**

Module II: Nuts and Bolts of Mixed Methods Research

This module aims to introduce students to the types of mixed-methods research. This includes a review of quantitative and qualitative research studies and how they comprise mixed methods designs. We will review the types of designs and how to conduct these studies based on understanding integrated methodology. We will review and explain various design types of rigorous mixed methods studies using interdisciplinary research studies.

Objectives:

- Review and explain the aspects of designing basic and advanced research studies
- Illustrate the components of choosing a design and conducting a mixed methods study, including intervention studies.

Session	Agenda	Required Readings	Assignments
Session 4 **9/14/23**	Designing Mixed Methods Studies • Mixed Methods Studies & Types of Studies • 3 Basic designs: Exploratory Sequential, Explanatory Sequential, Convergent	Creswell, J. W. (2015). *A concise introduction to mixed methods research*. Sage Publications, Inc. Chapter 2: Steps in Designing a Mixed Methods Study Curry, L., & M. Nunez-Smith (2015). *Mixed Methods in Health Sciences Research: A Practical Primer.* Sage Publications, Inc. Chapter 1: Definition and Overview of Mixed Methods Designs. Guest, G. (2013). Describing mixed methods research: An alternative to typologies. *Journal of Mixed Methods Research, 7*(2), 141-151.	**Student Lightning Talks**
Session 5 **9/21/23**	Designing Mixed Methods Studies • 4 Advanced frameworks: Multistage, Intervention, Case study, Participatory—Community-based participatory research, and transformative, Multi-level • Choosing a Design • Data Collection for Mixed Methods Studies	Creswell, J. W. (2015). A concise introduction to mixed methods research. Sage Publications, Inc. Chapter 2: Steps in Designing a Mixed Methods Study. Chapter 4: Basic and Advanced Mixed Methods Designs Chapter 5: How to Draw a Diagram of Procedures Curry, L., & M. Nunez-Smith (2015). Mixed Methods in Health Sciences Research: A Practical Primer. Sage Publications, Inc. Chapter 7: Sampling and Data Collection in Mixed Methods Studies	

		Bunger, A.C. et al. (2020). Establishing cross-systems collaborations for implementation: protocol for a longitudinal mixed methods study. *Implementation Science, 15*:55.	
Session 6 **9/28/23**	Designing Rigorous Mixed Methods Studies • Doing a Mixed Methods Study o Intervention Studies • Legitimation: Validity in Mixed Methods Research	Curry, L., & M. Nunez-Smith (2015). Mixed Methods in Health Sciences Research: A Practical Primer. Sage Publications, Inc. Chapter 9: Managing Mixed Methods Teams Fraser, M. W. (2004). Intervention research in social work: Recent advances and continuing challenges. *Research on Social Work Practice, 14*(3), 210-222. Onwuegbuzie, A.J. & Johnson, R.B. (2006). The validity issue in mixed research. *Research in the Schools, (13)*1, 48-63.	**Quiz 2 Due by end of Module II** **LOI Optional Draft Assignment Due**

Module III: Establishing Priority in Mixed Methods Research

This section will focus on the logic of inquiry, the overriding methodological or philosophical emphasis that essentially refers to a direct link to the philosophical assumptions of a methodology. In mixed methods research, priority has been considered an integral part of distinguishing the type of design, even though it is likely that priority can never be comprehensively evaluated until a study is complete. This is because the direction and execution of a mixed methods project can shift over time as unexpected challenges reshape a study. In this module, we will focus on priority as it refers to the design of a study and simplify the task of comparing studies by providing a common unit of analysis. Students will begin to learn about the use of secondary data in methods research.

Objectives:

- Introduce the prevalence of a quantitative priority and a qualitative priority in mixed methods research
- Illustrate strategies to establish priority
- Discuss equal priority mixed methods studies
- Understand the integration of secondary data in mixed methods research

Session	Agenda	Required Readings	Assignments
Session 7 **10/5/23**	The Quantitative Side of MMR & Point of interface • Quantitative method as a core component of MMR • Quantitatively-driven MMR	Maleku, A., Kim, Y.K., Kagotho, N. & Lim, Y. (2020). Expanding the transformative explanatory sequential mixed methods design archetype in a cross-cultural context: The polemics of African refugee livelihoods in places of resettlement.	

	• QUAN method options: Sampling, Pacing, Point of Interface • QUAN Core Designs • Modified Mixed Methods Studies: Secondary data	*Journal of Mixed Methods Research,* DOI: 10.1177/1558689820936378 Ivankova, N.V., Creswell, J.W., & Stick, S.L. (2006). Using mixed-methods sequential explanatory design: From Theory to Practice. Field Methods, 18(1), 3-20. Lamont, S. Brunero, S., Lyons, S., Foster, K. & Perry, L. (2015). Collaboration amongst clinical nursing leadership teams: a mixed methods sequential explanatory study. Journal of Nursing Management, 23, 1126-1136. Lalor, J.G., Casey, D., Elliott, N., Coyne, I., Comiskey, C., Higgins, K.M., Devane, D., and Begley, C. (2013). Using case study within a sequential explanatory design to evaluate the impact of specialist and advanced practice roles on clinical outcomes: the SCAPE study. Medical Research Methodology, 13: 55	**MID-TERM EVALUATION**

Session 8
 	
10/12/23
 	
Fall Break
 	
No CLASS
 	
Review materials Online
	The Qualitative Side of MMR & Point of Interface
	
	• Qualitative methods as a core component of MMR
	  • QUAL+ QUAN Simultaneous Designs
	  • QUAL → QUAN Sequential Designs
	  • Discussion on exemplar studies
		Kagotho, N., Maleku, A., Baaklini, V., Karandikar, S. & Mengo, C (2020) Substance Use, Service Provision, Access & Utilization among New Americans in the United States: Findings from a Mixed Methods Study. *Substance Use and Misuse.* First published online July 29, 2020.https://doi.org/10.1080/10826084.2020.1790006
		
		Watkins, D.C., Wharton, T., Mitchell, J.A., Matusko, N. & Kales, H.C. (2017). Perceptions and receptivity of non-spousal family support: A mixed methods study of psychological distress among older, church-going African American men. *Journal of Mixed Methods Research, 11*(4), 487-509.
		
		Gibson, P., Haight, W., Cho, M., Nashandi, N. J., & Yoon, Y. J. (2019). A mixed methods study of Black Girls' vulnerability to out-of-school suspensions: The intersection of race
			Quiz 3 Due by the end of Module III

		and gender. *Children and Youth Services Review*, *102*, 169-176. Catallo, C., Jack, S.M., Ciliska, D., & MacMillan, H. (2013). Mixing a grounded theory approach with a randomized controlled trail to intimate partner violence: What challenges arise from mixed methods research? *Nursing Research and Practice*.	

Module IV: Mixing Strategies, Analytical Procedures, Integration & Interpretation

The purpose of this domain is to introduce students to a variety of strategies that can be used effectively to execute a mixed methods analysis. Using interdisciplinary exemplar studies, we will introduce various strategies of data analysis, transformation, integration and interpretation for rigorous mixed methods research studies. We will also provide brief introduction on using MAXQDA data analysis program for mixed methods analysis and reporting.

Objectives:

- Illustrate strategies for mixing during early phases of a research project, including the wording of research questions, sampling procedures, and coding during data collection.
- Introduce different ways that data transformation can be used as a mixed-method analytical approach.
- Discuss interdisciplinary exemplar studies that illustrate mixing at different phases of the research project.

Session	Agenda	Required Readings	Assignments
Session 9 **10/19/23**	Strategies for Mixing Data for MMR • Mixing Prior to Analysis: Mixing in the purpose statement and research questions; mixing through sampling procedures; mixing during data collection; mixing during analysis; constructing conclusions through mixing. • Integration Levels: Design, Methods, Interpretation & Reporting	Creswell, J. W. (2015). A concise introduction to mixed methods research. Sage Publications, Inc. Chapter 7: Sampling and Integration Issues. Creamer, E. G. (2018). Executing fully integrated mixed methods research (pp 80-116). In *An Introduction to Fully Integrated Mixed Method Research.* Thousand Oaks, CA: SAGE Publications. Fetters, M., Curry, L.A, & Creswell, J.W. (2013). Achieving integration in mixed methods designs—Principles & practices. Health Services Research, 48(6 Pt 2): 2134-2156.	**LOI Due**

Session 10 **10/26/23**	Data Analysis & Integration in Mixed Methods Research • Mixed Methods Analytical Strategies • Mixing by Constructing inferences and meta-inferences • Illustrating Data Transformation: Qualitizing & Quantitizing Data	Watkins, D., & Gioia, D. (2015). *Mixed Methods Research*. New York: Oxford University Press. Fourth Floor: Mixed Methods Data Analysis Creamer, E.G. & Ghoston, M. (2012). Using a mixed methods content analysis to analyze mission statements from colleges of engineering. *Journal of Mixed Methods Research, 7*(2), 110-120 Elliott, J., Gale, C.R., Parsons, S., Kuh, D., & The HALCyon Study. (2014). Neighborhood cohesion and mental well-being among older adults: A mixed methods approach. *Social Science & Medicine, 107*, 44-51. Cooper, K. (2014). Eliciting engagement in the high school classroom: A mixed methods examination of teaching practices. *American Educational Research Journal, 51*(2), 363-402.	
Session 11 **11/2/23**	Data Analysis & Integration: Integration of Methods: • Connecting • Building Merging • Embedding • Narrative—Weaving, contiguous and staged	Teasley, M., Canifield, J.P., Archuleta, A.J., Crutchfield, J. & Chavis, A.C. (2012). Perceived barriers and facilitators to school social work practice: A mixed methods study. Children & Schools, 34(3), 145-153 Maleku A, Soukenik E, Haran H, Kirsch J, Pyakurel S. (2022). Conceptualizing Mental Health Through Bhutanese Refugee Lens: Findings from a Mixed Methods Study. *Community Mental Health Journal, 58*(2), 376-393. Maleku A, Kim YK, Kirsch J, Um MY, Haran H, Yu M, Moon SS (2022). The hidden minority: Discrimination and mental health among international students in the US during the COVID-19 pandemic. *Health Soc Care Community*, *30*(5): e2419-e2432. Wittink, M.N., Barg, F.K., Gallo, J.J. (2006). Unwritten rules of talking to doctors about depression: Integrating qualitative & quantitative methods. *Annals of Family Medicine, 4*(4), 302-309.	**Proposal Optional Draft Due**

Session 12 **11/9/23**	Data Analysis & Integration: Interpretation & Reporting • Data transformation • Joint displays	Creswell, J.W. (2015). *A concise introduction to mixed methods research*. Sage Publications, Inc. ✓ Chapter 10. The Development and Advancement of Mixed Methods. Plano Clark, V.L., Garrett, A.L., & Leslie-Pelecky, D.L. (2009). Applying three strategies for integrating quantitative and qualitative databases in a mixed methods study of a nontraditional graduate education program. *Field Methods, 22*, 154-174. Guetterman, T.C., Fetters, M.D., Fetters, M.D. & Creswell, J.W. (2015). Integrating quantitative and qualitative results in health science mixed methods research through joint displays. *Annals of Family Medicine, 13*(6), 554-56.	

Module V: Designing and Reporting Rigorous Mixed Methods Research

In this module, we bring all the major concepts from earlier modules and discuss writing, presenting, and communicating mixed methods. Revisiting the importance of rigor in mixed methods research, we will provide an overview of different types of diagrams used in mixed methods research as well as helpful hints for communicating the results of a mixed methods study to various audiences. This section will focus on writing mixed methods publications, doctoral dissertations, and grant proposals. The final session will cover some main controversies, guiding future research: should we talk about mixed methods or strategies? About integration or complementarity? Do mixed methods really collect better data and improve theory?

Objectives:

- Identify reporting guidelines for methodological transparency
- Present strategies for reporting mixed methods research
- Explore ways in which figures can be used to depict the steps in the research process, including how mixing is accomplished.
- Understand criteria for evaluating quality in mixed methods research.
- Explore controversies in Mixed Methods Research and future directions

Session	Agenda	Required Readings	Assignments
Session 13 11/16/23	Writing Up Mixed Methods Research • Publications • Grants • Doctoral Dissertations Evaluating Quality in Mixed Methods Research Publications • Transparency • Amount of mixing • Interpretive comprehensiveness at various research phases Controversies & Future Directions in Mixed Methods Research	Creswell, J.W. (2015). *A concise introduction to mixed methods research*. Sage Publications, Inc. ✓ Chapter 8. Writing a Mixed Methods Study for Publication. ✓ Chapter 9: Evaluating the Quality of Mixed Methods Study. Creswell, J.W. & Tashakkori, A. (2007). Developing publishable mixed methods manuscripts. Journal of Mixed Methods Research, 1(2), 107-111. Maleku, A., Kagotho, N., Baaklini, V & Filburn, C., Karandikar, S., Mengo, C. (2020). The human service landscape in the midwestern U.S.: A mixed methods study of human service equity among the New American population. *The British Journal of Social Work, 50*(1), 195-221. Creamer, E. G. (2018). Designing and Reporting a fully integrated mixed methods research proposal or doctoral dissertation (pp 170-96). In *An Introduction to Fully Integrated Mixed Method Research.* Thousand Oaks, CA: SAGE Publications. ✓ Chapter 8. Writing a Mixed Methods Study for Publication ✓ Chapter 9. Evaluating the Quality of a Mixed Methods Study Creswell, J.W. (2011), Controversies in Mixed Methods Research, in Denzin, N.K. and Lincoln Y.S., The SAGE Handbook of Qualitative Research, chap. 15, pp. 269- 83, 4th edition.	
11/23/23 NO CLASS			
Session 14 **11/30/23**	**Mixed Methods Research Proposal: STUDENT PRESENTATIONS**		**Final Assignment Due on 12/1/23**

Appendix 3: Letters of Support

College of Public Health: Division of Biostatistics, Kellie J. Archer, PhD

College of Public Health: Division of Health Behavior and Health Promotion, Elizabeth G. Klein, PhD, MPH

College of Medicine: School of Health and Rehabilitation Sciences, Amanda M. Agnew, PhD

College of Arts & Sciences: Department of Evolution, Ecology and Organismal Biology

Office of Research, Julia Behnfeldt, PhD, and Mary Kivel

John Glenn College of Public Affairs, Robert T. Greenbaum, PhD

College of Social Work, David Jenkins, PhD

THE OHIO STATE UNIVERSITY

College of Public Health

Kellie J. Archer, Ph.D.
Professor and Chair, Division of Biostatistics

240 Cunz Hall
1841 Neil Avenue
Columbus, OH 43210

614-247-6167 Phone
614-247-1955 Fax

cph.osu.edu

July 24, 2023

W. Randy Smith, PhD
Vice Provost for Academic Programs
Council on Academic Affairs
Office of Academic Affairs
203 Bricker Hall
190 North Oval Mall
Columbus, OH 43210

Dear Dr. Smith:

As the Chair of Division of Biostatistics in the College of Public Health, I strongly endorse the addition of addition of four courses from the division to the curriculum options for the Graduate Interdisciplinary Specialization in Biomedical and Translational Science (BIOMCLT-IS).

Courses from the College of Public Health have always been an important component of the BIOMCLT-IS, including the core course, PUBHEPI 6412: Basic Principles in Clinical and Translational Science. The academic director of the BIOMCLT-IS, Ginny Bumgardner, MD, PhD, is revising and updating the curriculum for the specialization. As part of this process, we both agree that following courses should be added:

PUBHBIO 5280: Introduction to Genomic Data Analysis

PUBHBIO 7215: Design and Analysis of Clinical Trials

PUBHBIO 6210 - Applied Biostatistics I

PUBHBIO 6211 - Applied Biostatistics II

Since the development of this specialization more than a decade ago, genomics has become increasingly important in biomedical research and in the research interests of graduate students. The addition of Introduction to Genomic Data Analysis will round out the training of students whose research is not completely focused on genomics, but which has a genomic component. This course will enhance the student's ability to work on transdisciplinary teams with biochemists, geneticists, and biostatisticians.

The Design and Analysis of Clinical Trials provides vital training to students interested in clinical research. This course replaces PUBHBIO 6280, previously in the specialization curriculum but no longer in the College of Public Health course catalog.

Likewise, the two Applied Biostatistics courses requested for the Data and Analysis track of the specialization, replace a course series that is no longer offered. The BIOMCLT-IS offers several course options in the area of statistics from different disciplines. It is obviously important that courses in biostatics from the College of Public Health be a part of that choice.

In conclusion, the Division of Biostatistics in the College of Public Health is pleased to continue its ongoing cooperation with the CCTS to develop the biomedical research workforce of tomorrow through support for the BIOMCLT-IS.

Respectfully submitted,

Kellie J. Archer, Ph.D.
Professor and Chair, Division of Biostatistics
College of Public Health
The Ohio State University

Division of Health Behavior and Health Promotion

College of Public Health
359 –A Cunz Hall
1841 Neil Avenue
Columbus, OH 43210

Phone (614) 292-4685
Fax (614) 688-3533
Web: http://cph.osu.edu

W. Randy Smith, PhD
Vice Provost for Academic Programs
Council on Academic Affairs
Office of Academic Affairs
203 Bricker Hall
190 North Oval Mall
Columbus, OH 43210

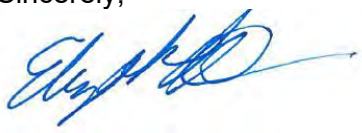
Dear Dr. Smith:

Dr. Ginny Bumgardner, the Program Director Graduate Interdisciplinary Specialization in Biomedical and Translational Science (BIOMCLT-IS), approached us to get our support for adding a course from the College of Public Health, Division of Health Behavior and Health Promotion. The course is PUBHHBP 6535: Community Engagement and Collaborative Community Problem-Solving. As the Chair of the HBHP Division, on behalf of the faculty instructing this course, strongly endorse the addition this course to the BIOMCLT-IS.

Courses from the College of Public Health have always been an important component of the BIOMCLT-IS, including the core course, PUBHEPI 6412: Basic Principles in Clinical and Translational Science. In addition, the curriculum includes options from the divisions of Epidemiology and Biostatistics. This course, Community Engagement and Collaborative Community Problem-Solving, provides students the opportunity to review a number of concepts critical to collaborative community problem-solving. A broad range of literature is reviewed and students have the opportunity to experience several simulated processes unique to the collaborative problem-solving process.

Community engagement has long been an emphasis at the OSU Center for Clinical and Translational Science, where Professor Emeritus Pamela Salsberry, PhD, from our Division has long been the faculty leader. Understanding the principles and best practices of community engagement are vital skills for clinical and translational researchers and scientists and this course option the specialization helps to address that need.

In conclusion, the Division of Health Behavior and Health Promotion in the College of Public Health is pleased to continue its ongoing cooperation with the CCTS to develop the biomedical research workforce of tomorrow through support for the BIOMCLT-IS.
Sincerely,



Elizabeth G. Klein, PhD, MPH
Professor & Chair
Health Behavior & Health Promotion

THE OHIO STATE UNIVERSITY
SCHOOL OF HEALTH AND
REHABILITATION SCIENCES

Graduate Program Office
206 Atwell Hall
453 W.10th Avenue
Columbus, OH 43210
614-292-1706
https://hrs.osu.edu

June 5, 2023

Maria Miriti, PhD
Interim Associate Dean for Academic Affairs
The Ohio State University Graduate School
250 University Hall
230 N. Oval Mall
Columbus, OH 43210

Dear Dr. Miriti:

The academic director of the Graduate Interdisciplinary Specialization in Biomedical and Translational Science (BIOMCLT-IS), Ginny Bumgardner, MD, PhD, has asked if courses from the curriculum of the School of Health and Rehabilitation Sciences could be added to the BIOMCLT-IS curriculum. We write to express our full support for adding two courses from HRS to the course options for the BIOMCLT-IS.

Specifically, the request is to add two courses to the Research Methods track:

HTHRHSC 7883. Responsible Conduct of Research
HTHRHSC 7574: Mixed Methods Approaches for Policy-Related Research

The BIOMCLT-IS is designed to prepare students to be actively engaged in the field of clinical and translational science through academic training and research. It is part of the portfolio of training programs developed by the Center for Clinical & Translational Science (CCTS) to expand the clinical research workforce to meet critical demands. We are glad to already partner with the CCTS on the BIOMCLT-IS by including two of our courses in the list of options (HTHRHSC 7300: Management and Leadership in Health Sciences and HTHRHSC 7350: Issues and Policy in Health Sciences). These two new courses can accommodate the additional students that will result from including them in the BIOMCLT-IS. Many of these students are likely to be from outside the School of Health and Rehabilitation Science, adding an interdisciplinary aspect to the course experience for our students.

The seminar HTHRHSC 7883 encompasses a variety of topics required by the NIH for responsible conduct of research training. We agree with the academic director of the BIOMCLT-IS that adding this course option widens the choices for training in this area available to students, making it easier to find training that fits with their schedules and the interdisciplinary guidelines for the BIOMCLT-IS

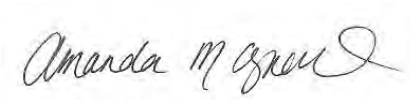
HTHRHSC 7574: Mixed Methods Approaches for Policy-Related Research is a course we offer in conjunction with the Ohio State University Glenn College of Public Affairs to meet the increasing use of mixed methods research. This research method is an important tool in the researcher's tool kit, but mixed-methods research has its own special complexities. This course offers training in the special considerations that are key to successful mixed methos research, including study design and evaluation, among other issues. As such, it is an important course option for students in the BIOMCLT-IS.

In conclusion, we support for adding these two course options to the BIOMCLT-IS.

THE OHIO STATE UNIVERSITY
SCHOOL OF HEALTH AND
REHABILITATION SCIENCES

Graduate Program Office
206 Atwell Hall
453 W.10th Avenue
Columbus, OH 43210
614-292-1706
https://hrs.osu.edu

Sincerely,



Amanda Agnew, PhD
Director of Graduate Studies
School of Health and Rehabilitation Sciences

Marcia Nahikian-Nelms, PhD, RDN, LD, CNSC, FAND
Assistant Dean for Academic Affairs
School of Health and Rehabilitation Sciences

THE OHIO STATE UNIVERSITY

Department of Evolution, Ecology and Organismal Biology

318 W. 12th Ave.
Columbus, OH 43210

614-292-8088 Phone
614-292-2030 Fax
eeob.osu.edu

July 24th, 2023

to: W. Randy Smith, PhD, Vice Provost for Academic Programs

re: Letter of Support for addition of EEOB 5510 to BIOMCLT-IS curriculum

Dear Dr. Smith:

The academic director of the Graduate Interdisciplinary Specialization in Biomedical and Translational Science (BIOMCLT-IS), Ginny Bumgardner, MD, PhD, has asked if EEOB 5510: Interdisciplinary Team Science from the curriculum of the Department Evolution, Ecology, and Organismal Biology, could be added to the BIOMCLT-IS curriculum. We enthusiastically support this action.

Team science is widely regarded as the future of scientific research. For example, the NSF has identified "Growing Convergence Research" as one of its 10 Big Ideas. True convergence research requires the development of interdisciplinary scientific teams (groups of 2 or more working collaboratively to solve a problem). However, graduate students are often siloed within programs, and not necessarily trained to engage with others outside their field. This course aims to teach students the necessary skills to lead or participate in scientific or interdisciplinary teams.

The objectives of EEOB 5510: Interdisciplinary Team Science are to teach students

- The science of team science
- The skills that produce effective teams
- How to collaborate effectively within an interdisciplinary team
- How to build and lead a team
- How to write a project collaboration plan

The clinical and translational science interdisciplinary specialization is designed to prepare students to be actively engaged in the field of clinical and translational science. Cross disciplinary team science is one of the translational science principles identified by the National Institute of Health.

We agree with Dr. Bumgardner that Interdisciplinary Team Science offers important content for graduate students studying biomedical science. Instructor Dr. Alison Bennett will welcome any of the CCTS T32 trainees who choose to take this course, as well as other students participating in the BIOMCLT-IS.

In conclusion, we support for adding EEOB 5510: Interdisciplinary Team Science to the course options for the BIOMCLT-IS.

Sincerely,

Bryan C. Carstens
Professor & Chair, Department of Evolution, Ecology, and Organismal Biology
Head of the Tetrapod Collection, Museum of Biological Diversity
Founding Editor, Bulletin of the Society of Systematic Biologists

Office of Research

THE OHIO STATE UNIVERSITY

Office of Research Compliance
1050 Carmack Road
Mount Hall, Office 120B
orc.osu.edu

February 21, 2024

W. Randy Smith, PhD
Vice Provost for Academic Programs
Council on Academic Affairs
Office of Academic Affairs
203 Bricker Hall
190 North Oval Mall
Columbus, OH 43210

Dear Dr. Smith:

In the course of revising the curriculum for the Graduate Interdisciplinary Specialization in Biomedical and Translational Science (BIOMCLT-IS), academic director Dr. Ginny Bumgardner asked that the course "GRADSCH 8000: Responsible and Ethical Conduct of Research" be added. I write to express our full support for adding this class the course options for the BIOMCLT-IS.

In 2023, in response to the National Institutes of Health's "FY 2022 Updated Guidance: Requirement for Instruction in the Responsible Conduct of Research," (NOT-OD-22-055) the Office of Research conducted a review of course syllabi in Responsible Conduct of Research (RCR) offerings at Ohio State. As outlined in the resulting report, "Institutional Responsible Conduct of Research Training Plan," there are many courses at various colleges that meet RCR training requirements. However, to ensure access by all graduate students and faculty to RCR training that addresses all the requirements from NIH, a new course, Graduate School 8000, was created. This course is open to graduate students regardless of their program or major, postdoctoral fellows, and early career faculty and will be offered annually or semiannually as demanded by enrollment.

Because students participating in the BIOMCLT-IS come from a variety of disciplines and colleges, I agree with the academic director that adding this course option widens the choices for students for training in this area, making it easier to find training that fits with their schedules and the interdisciplinary guidelines for the BIOMCLT-IS.

The BIOMCLT-IS is designed to prepare students to be actively engaged in the field of clinical and translational science through academic training and research. It is part of the portfolio of training programs developed by the Center for Clinical & Translational Science (CCTS) to expand the clinical research workforce to meet critical demands. The Office of Research is glad to partner with the CCTS in this effort through including GRADSCH 8000 as a course option in the interdisciplinary specialization.

Sincerely,

Julia Behnfeldt, PhD
Course Instructor
Associate Director, Office of Research Compliance
Office of Research

Mary Kivel
Course Instructor
Instructional Designer
Office of Research

THE OHIO STATE UNIVERSITY

John Glenn College of Public Affairs

Robert T. Greenbaum
Associate Dean for Curriculum

350E Page Hall
1810 College Road
Columbus, OH 43210
614-292-9578
greenbaum.3@osu.edu
glenn.osu.edu

February 15, 2024

W. Randy Smith, PhD
Vice Provost for Academic Programs
Council on Academic Affairs
Office of Academic Affairs
203 Bricker Hall
190 North Oval Mall
Columbus, OH 43210

Dear Randy:

The John Glenn College of Public Affairs endorses the addition of one of our courses to the curriculum options for the Graduate Interdisciplinary Specialization in Biomedical and Translational Science (BIOMCLT-IS).

The requested course, PUBAFRS 7572: Policy Simulation and Modeling, is intended for the Leadership & Team Science track. The need for scientific voices in public policy today is acute. This course will provide students in the BIOMCLT-IS an introduction to the development of conceptual and data models for public policy analysis. The course is a good compliment to PUBAFRS 6000: Public Policy Formulation and Implementation that has been a part of the BIOMCLT-IS curriculum for some time.

The Glenn College of Public Affairs is pleased to continue our ongoing cooperation with the CCTS to develop the biomedical research workforce of tomorrow through support for the BIOMCLT-IS.

Sincerely,

Robert T. Greenbaum,
Professor

THE OHIO STATE UNIVERSITY

College of Social Work
Office of the Dean
Stillman Hall
1947 N. College Road
Columbus, OH 43210-1162
614-292-6288 Phone
614-292-6940 Fax
csw.osu.edu

February 13, 2024

W. Randy Smith, PhD
Council on Academic Affairs
Office of Academic Affairs
203 Bricker Hall, 190 North Oval Mall
Columbus, OH 43210

Dear Dr. Smith:

The College of Social Work is pleased to support the request from the academic director of the Graduate Interdisciplinary Specialization in Biomedical and Translational Science (BIOMCLT-IS), Dr. Ginny Bumgardner, to add a course from the College of Social Work to the curriculum options for the BIOMCLT-IS.

The requested course is *SOCWORK 8406: Mixed Methods Research in Social and Health Sciences*. This course provides an overview of mixed methods approaches, with an emphasis on application to social and health sciences research. Mixed methods are increasingly used by health science and other researchers. Having some training in this area will be a useful skill in the clinical and translational researcher's tool kit.

This course has a limited enrollment of 12, and we will have to prioritize Social Work graduate students, but neither we nor the leadership of the BIOMCLT-IS believe that this will cause any difficulties most of the time. Indeed, the College of Social Work is pleased to cooperate with the CCTS in this matter, as ours is one of the few graduate level courses in mixed methods at Ohio State.

Sincerely,

David Jenkins
Dean

From:	Clinchot, Dan
To:	Reed, Katie
Subject:	Re: Forwarding Proposal: BIOMCLT
Date:	Wednesday, October 30, 2024 9:32:26 AM
Attachments:	image001.png

Yes Katie the College has reviewed and approved the proposal. Best Dan

---

From: Reed, Katie <reed.901@osu.edu>
Date: Monday, October 28, 2024 at 3:50 PM
To: Clinchot, Dan <Dan.Clinchot@osumc.edu>
Subject: FW: Forwarding Proposal: BIOMCLT

Dear Dr. Clinchot:

Has the College of Medicine reviewed and approved this proposal?

Thanks,
Katie

From: Kowalsky, Lisa <kowalsky.10@osu.edu>
Sent: Thursday, October 24, 2024 5:01 PM
To: Reed, Katie <reed.901@osu.edu>
Cc: Hobbs, Stuart (OSUMC) <stuart.hobbs@osumc.edu>; Miriti, Maria <miriti.1@osu.edu>
Subject: Forwarding Proposal: BIOMCLT

Dear Katie,

Please find attached a proposal from the Clinical and Translational Science Institute to revise the BIOMCLT-IS. It has been reviewed at GS/CAA and is supported for review at CAA.
Please let me know if any questions or concerns arise.

Best,
Lisa

THE OHIO STATE UNIVERSITY
GRADUATE SCHOOL

Lisa Clouser (Kowalsky)

The Ohio State University
Graduate School
247E University Hall
230 N. Oval Mall, Columbus, OH 43210
614-292-2267 Office

gradsch.osu.edu

Pronouns: she/her/hers