

Graduate School of Public Health
Educational Policies and Curriculum Committee
April 11, 2019
1:30-3:30pm
1149 Public Health

1. Modified course re-visit: EPIDEM 2602: *Application of Molecular Biomarkers in Epidemiology*, Jennifer Abidi (EPIDEM)
2. New BOST MS area of concentration: *Health Data Science*, Ada Youk (BOST)
3. New BOST MS area of concentration: *Computational Genomics*, Ada Youk (BOST)
4. New course: BOST XXXX: *Capstone*, Ada Youk (BOST)
5. New course: BOST 2079: *Introductory Statistical Learning for Health Sciences*, George Tseng (BOST)
6. New course: BOST 2080: *Advanced Statistical Learning*, Lu Tang (BOST)
7. New course: BCHS 2XXX: *Harm Reduction Approaches in Health and Public Health Settings*, Mary Hawk (BCHS)
8. Approval cross-listing with School of Medicine & BCHS course: Social Networks and Health [effective fall 2019]
9. Approval of March Meeting Minutes, All

EPID2602 Application of Molecular Biomarkers in Epidemiology

Fall 2019

Graduate School of Public Health, Department of Epidemiology
University of Pittsburgh

Course Meeting Day(s) and Time(s): Wednesday: 10:00 - 11:50 am
Friday: 10:30 – 12:20 pm

Class Locations:

Lectures: A622 Crabtree Hall

Lab-based classes: Public Health Annex 3001

Credit Hours: 2

Term/Academic Year First half Fall 2019 (August 28 – October 18th, one Monday and one Wednesday class will be cancelled to not exceed the required 1500 credit hours.)

Principal Instructor: Dr. Jennifer J. Adibi MPH, ScD

Department of Epidemiology

Office Location: 5132 Public Health, 130 Desoto Street, Pittsburgh, PA 15261

Tel. 412-624-1913, adibij@pitt.edu

Office Hours: By appointment

Course Description

This course will advance the learning of students interested in molecular epidemiology by teaching practical aspects of measuring, quantifying and modeling levels of RNA and protein in human biological specimens (blood, tissue, etc). Some topics will include: selecting and validating biomarkers of RNA and protein for application in epidemiologic study design, candidate molecule vs. omics (high-dimensional) approaches, basic know-how in the design and execution of bioassays, and statistical issues in biomarker data analysis. Students will observe the work of a molecular epidemiology laboratory, and have opportunities for hands-on learning.

Course Prerequisites

Prerequisites include undergraduate biology, at least one course in Epidemiology, one course in Biostatistics, and Introduction to Molecular Epidemiology (EPID 2600), or instructor permission.

Learning Objectives

After taking this course, students can:

- 1) Apply RNA and protein biomarkers to increase knowledge of how a particular exposure (genetic, environmental, physiologic, psychosocial) relates to a health outcome;
- 2) Map a biomarker to physiologic and pathophysiologic processes, and to measure and model these relationships;
- 3) Apply low-dimensional and high-dimensional molecular ('omics') analyses in epidemiology and integrate molecular biomarkers into analysis and inference on exposure-outcome relationships;
- 4) Critically assess internal and external validity in epidemiologic studies in which investigators have analyzed molecular biomarkers. Students will evaluate measurement error, bias, technical and biologic variability, quantitation and statistical methods.

Teaching Philosophy

This course is an opportunity to apply biomarkers in current and future research. The course will be taught as a workshop with information presented as well as opportunities for students to engage in hands-on learning in the laboratory and also with biomarker data sets. Students will become familiar with the Department's molecular epidemiology laboratory.

Required Textbooks/Articles/Readings

There are no required texts. Required reading (journal articles, protocols) will be posted on the CourseWeb site by the beginning of the semester.

Laboratory Safety Training

Students in the course will be required to complete the Environmental Health and Safety online trainings. These are short, user-friendly training modules.

<http://www.ehs.pitt.edu/assets/docs/onlinetraining.html>

1. Bloodborne Pathogens Training for Laboratory Personnel
2. Chemical Hygiene
3. Personal Protective Equipment

CourseWeb/BlackBoard Instruction

Revisions to this document, schedules, readings, and assignments will be posted to CourseWeb. All students are required to log on weekly and check CourseWeb.

Class Expectations/ Behavior and Ground Rules

We expect students to attend all classes, do weekly readings, and to use class time to engage and articulate their thoughts and questions. We assume many students completed the Introduction to Molecular Epidemiology course (EPID 2600), and will use this time to dive deeper into practical application of molecular biology techniques to epidemiologic questions of interest. Readings, short youtube videos, and assignments (i.e. questions and short answers, analyses and presentation of biomarker data, full critique and presentation of a published molecular biomarker study) will be given to reinforce practical learning. As part of class participation, students will be asked to select and lead discussion on papers in their field of interest.

Grading Scale: The final grade will be based on percentages and letter grades.

Grade option:	Grading scale:		
Letter grade	97 - 100% A+	77 - 79.9% C+	< 60% F
	93 - 96.9% A	73 - 76.9% C	
	90 - 92.9% A-	70 - 72.9% C-	
	87 - 89.9% B+	67 - 69.9% D+	
	83 - 86.9% B	63 - 66.9% D	
	80 - 82.9% B-	60 - 62.9% D-	

Student Performance Evaluation

Final grades will be based on: 60% attendance and active participation (asking questions, offering answers to questions); 40% weekly assignments (short answer questions, analysis of raw biomarker data sets, critique of a published molecular biomarker study). Students will turn in one assignment per week, and prepare a short presentation for the final class. Each assignment will be worth 20 points. If the class is 400 points and you attend and participate in class, you will receive 240 points and the remainder of the grade will be based on the scores on your assignments. Attendance and participation are critical to success in this course given the emphasis on practical learning. You may only miss one class (please let me know in advance). Any other absences must be excused by the instructor. Participation must include active engagement in class discussions and time spent in the wet lab.

Assignments and Descriptions

Students will be required to do course readings weekly, and assignments. **The assignments listed below are due at the beginning of the class the following week.** Class attendance and participation are the most critical assignment and, accordingly, make up 60% of the final grade, combined. There will be 6 assignments to reinforce practical knowledge.

Schedule of Sessions and Assignments

Week	Topic	Teacher
1	Lecture: Introduction and overview of molecular biomarkers and their role in epidemiologic and public health research	J. Adibi
	Assignment: Read lecture notes, 3 online EHS trainings (print and bring certificates of completion to next class)	
2	Lecture 1: Reproducibility	J. Adibi
	Lecture 2: Developing a conceptual framework for research using molecular biomarkers (Logic, DAG theory, the p-value)	J. Adibi
	Assignment: Short answers to questions	
3	Lecture: mRNA quantitation Part I: conceptual and practical	J. Adibi
	Lab: tissue homogenization, RNA isolation	Lab staff
	Assignment: RNA biomarker data analysis, summary, Part I	
4	Lecture: mRNA quantitation Part II: conceptual and practical	J. Adibi
	Lab: RNA quantitation, reverse transcription, qPCR	Lab staff
	Assignment: RNA biomarker data analysis, summary, Part II	
5	Lecture: Protein quantitation Part I: conceptual and practical	J. Adibi
	Lab: quantitative western blot, outline the steps, visualization and quantitation of data	Lab staff
	Assignment: Protein biomarker data analysis, summary, Part I	
6	Lecture: Protein quantitation: why and how, Part II	J. Adibi
	Lab: analysis of circulating proteins	Lab staff
	Assignment: Protein biomarker data analysis, summary, Part II	
7	Lecture 1: Going from low to high dimensional biomarkers by applying the omics technologies	J. Adibi
	Lecture 2: Modeling direct vs. indirect effects (interaction, mediation)	J. Adibi
	Assignment: data analysis exercise	
8	Lecture 1: Synthesis of course material, student presentations of final assignment.	J.Adibi/ students
	Assignment: Oral/written critique of an application of a molecular biomarker in epidemiology	J.Adibi/ students

Accommodation for Students with Disabilities

If you have any disability for which you may require accommodation, you are encouraged to notify both your instructor and the Office of Disability Resources and Services, 140 William Pitt Union (Voice or TTD 412-648-7890) as early as possible in the term.

Academic Integrity Statement

All students are expected to adhere to the school’s standards of academic honesty. Cheating/plagiarism will not be tolerated. The Graduate School of Public Health’s policy on academic integrity, which is based on the University policy, is available online in the Pitt Public Health Academic Handbook www.publichealth.pitt.edu/home/academics/academic-requirements. The policy includes obligations for faculty and students, procedures for adjudicating violations, and other critical information. Please take the time to read this policy.

Sexual Misconduct, Required Reporting and Title IX Statement

The University is committed to combatting sexual misconduct. As a result, you should know that University faculty and staff members are required to report any instances of sexual misconduct, including harassment and sexual violence, to the University's Title IX office so that the victim may be provided appropriate resources and support options. What this means is that as your professor, I am required to report any incidents of sexual misconduct that are directly reported to me, or of which I am somehow made aware.

There are two important exceptions to this requirement about which you should be aware: A list of the designated University employees who, as counselors and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: www.titleix.pitt.edu/report/confidentiality

An important exception to the reporting requirement exists for academic work. Disclosures about sexual misconduct that are shared as part of an academic project, classroom discussion, or course assignment, are not required to be disclosed to the University's Title IX office.

If you are the victim of sexual misconduct, Pitt encourages you to reach out to these resources:

- Title IX Office: 412-648-7860
- SHARE @ the University Counseling Center: 412-648-7930 (8:30 A.M. TO 5 P.M. M-F) and 412-648-7856 (AFTER BUSINESS HOURS)

If you have a safety concern, please contact the University of Pittsburgh Police, 412-624-2121. Other reporting information is available here: www.titleix.pitt.edu/report-0

Statement from the Department of Gender, Sexuality, and Women's Studies
[This statement was developed by Katie Pope, Title IX Coordinator, in conjunction with GSWS instructors.]

Diversity Statement

The University of Pittsburgh Graduate School of Public Health considers the diversity of its students, faculty, and staff to be a strength and critical to its educational mission. Pitt Public Health is committed to creating and fostering inclusive learning environments that value human dignity and equity. Every member of our community is expected to be respectful of the individual perspectives, experiences, behaviors, worldviews, and backgrounds of others. While intellectual disagreement may be constructive, no derogatory statements, or demeaning or discriminatory behavior will be permitted.

If you feel uncomfortable or would like to discuss a situation, please contact any of the following:

- the course instructor;
- the Pitt Public Health Associate Dean for Diversity at 412-624-3506 or nam137@pitt.edu;
- the University's Office of Diversity and Inclusion at 412-648-7860 or <https://www.diversity.pitt.edu/make-report/report-form> (anonymous reporting form).

Copyright Notice

Course material may be protected by copyright. United States copyright law, 14 USC section 101, et sec., in addition to University policy and procedures, prohibit unauthorized duplication or retransmission of course materials. See [Library of Congress Copyright Office](#) and the [University Copyright Policy](#).

Health Sciences Library and Pitt Public Health Librarian

We encourage students to access the HSLs Molecular Biology online resource for more in-depth information on molecular biology methods, <http://www.hsls.pitt.edu/molbio/>. They offer regular workshops and tutorials on technologies and data analysis methods.



University of Pittsburgh

*Graduate School of Public Health
Department of Biostatistics*

7135 Parran hall
130 DeSoto Street
Pittsburgh, PA 15261
Phone: 412-624-3022
Fax: 412-624-2183
www.biostat.pitt.edu

March 29, 2019

Subject: New Concentrations for BIOST MS Program

Dear EPCC Members:

Attached is the proposal for two new concentrations (Health Data Science (HDS) and Statistical and Computational Genomics (SCG)) that Biostatistics is proposing for our MS degree. We are also including the syllabi and checklists for three new courses that are to be included in these new concentrations (Capstone, Introduction to Statistical Learning for Health Sciences and Advanced Statistical Learning).

The MS degree in Biostatistics currently offered by our department provides rigorous training in applied biostatistical methods and theory. We have successfully trained students for many years and will continue to provide this traditional broad biostatistical training to new generations of students. However, the field of Biostatistics is constantly evolving and advancements in technology in biomedical and public health research are generating complex high-dimensional and large volume data. To address the needs of modern high dimensional science, computationally intensive statistical methods have become a fundamental part of scientific research and a critical component in advancing public health. To keep pace with scientific needs, we propose to create two areas of concentration that will complement our current MS program and allow training in high dimensional and 'omics data: Health Data Science (HDS) and Statistical and Computational Genomics (SCG). These areas of concentration will assure that the Department of Biostatistics will train graduate students suitable for the evolving job market while keeping rigor with traditional methodologies.

Sincerely,

A handwritten signature in cursive script that reads "Ada O. Youk".

Ada O. Youk
Associate Professor of Biostatistics
ayouk@pitt.edu

Proposal for Two Areas of Concentration for the MS Degree in Biostatistics: Health Data Science (HDS) and Statistical and Computational Genomics (SCG)
Department of Biostatistics
Graduate School of Public Health
March 2019

(1) Submitted by:

Ada Youk, Associate Professor, Department of Biostatistics
George Tseng, Professor, Department of Biostatistics
Jong Jeong, Professor, Department of Biostatistics
Shyamal Peddada, Chair, Department of Biostatistics

(2) A description of the academic requirements of the new program, a comparison with requirements of similar programs offered by the unit, and a discussion of new courses, internships, research experiences, etc., which must be introduced to offer the program.

The MS degree in Biostatistics currently offered by our department provides rigorous training in applied biostatistical methods and theory. We have successfully trained students for many years and will continue to provide this traditional broad biostatistical training to new generations of students. Our students have been very successful finding good jobs or entering PhD programs. However, the field of Biostatistics is constantly expanding and evolving. Advancements in technology in biomedical and public health research are generating complex high-dimensional and large volume data. Standard biostatistical and computational methods are not always feasible, or even appropriate, for analyzing and interpreting such data. To address the needs of modern high dimensional science, computationally intensive statistical methods have become a fundamental part of scientific research and a critical component in advancing public health. Novel biostatistical methods and computational algorithms are being developed to address these latest challenges. Graduate programs in biostatistics are modifying and expanding their programs to train students to become the next generation of biomedical researchers. To keep pace with scientific needs, we propose to create two areas of concentration that will complement our current MS program and allow training in high dimensional and 'omics data: Health Data Science (HDS) and Statistical and Computational Genomics (SCG). These areas of concentration will assure that the Department of Biostatistics will train graduate students suitable for the evolving job market while keeping rigor with traditional methodologies. These areas of concentrations have been under discussion and development by faculty of the Department of Biostatistics for over a year. They include a core set of traditional courses in biostatistics, as well as sets of courses in data science and information science (HDS) and courses and in genomics and computational biology (SCG). The current MS program will incorporate a new Capstone course culminating in an applied thesis that demonstrates the student's competency in biostatistics as well as oral and written communication skills in general. Students enrolled in an area of concentration will enroll in the Capstone course with the additional requirement that they demonstrate competency in their chosen area of concentration.

The fields of HDS and SCG both require knowledge and training in programming, statistical methodology, and communication skills. Students in either concentration will take courses in statistical theory and methodology, which will provide rigorous statistical foundations. Students in the HDS concentration will take courses in programming languages (e.g. SQL, R, SAS, Python) as well as courses on database analytics, data mining and database management. These computer science related courses will provide foundations for students to store, manage, manipulate and process high dimensional data.

Students in the SCG concentration will take courses in modern computational methods for high dimensional data, genomics and molecular biology. Students will gain a deeper and critical understanding of strengths and limitations of various statistical computational procedures for analyzing, processing and interpreting large-scale data sets (HDS) and genomic data (SCG).

In addition, the required foundational public health courses and elective courses within GSPH provides public health context to our current MS program and will apply for both concentrations. Also critical to our MS degree, regardless of concentration, is the development of communication skills. Students will take a newly created Capstone course that culminates in a written thesis. This written milestone can be based on an internship experience, work on a research project with a faculty member or an analysis of publicly available research data guided by the course mentors. Students will also participate in statistical consulting by either enrolling in the consulting course or working with researchers outside of the classroom as hourly employees. This will allow students to learn how to ask researchers questions about their projects and to help them formulate the scientific question or hypotheses of interest. They will also learn how to develop robust computational and/or statistical methodology as well as effectively communicate analytical results, so that they are statistically and scientifically valid as well as understandable to the researcher who may not have the statistical expertise. Thus, students enrolling in our program will receive a very comprehensive education that will prepare them well to enter the modern job market.

More precisely, the Learning Objectives are as follows:

Graduates of the MS Program in Biostatistics will be able to:

- Address health problems by appropriate problem definition, study design, data collection, data management, statistical analysis, and interpretation of results
- Demonstrate mastery of the theory underlying statistical methods
- Implement and utilize appropriate statistical methods
- Effectively communicate results of biostatistical analyses to scientific and lay audiences
- Apply research design principles to problems in public health
- Recognize strengths and weaknesses of approaches, including alternative designs, data sources, and analytic methods
- Determine the data best suited to address public health issues, program planning, and program evaluation

In addition, students in the following areas of concentration will be able to:

HDS:

- Transform and map data into proper form for meaningful analyses
- Apply methods for big data and machine learning to reveal patterns, trends and associations
- Effectively use a programming language (such as R and/or Python) for data management and statistical analysis

SCG:

- Transform and map genomic data into proper form for meaningful analyses
- Apply appropriate statistical and computational methods for various 'omics data
- Effectively use a programming language (such as R) to analyze genomic data

A side-by-side comparison of course curriculum for our MS program in Biostatistics and concentrations in HDS and SCG is outlined in the table below:

MS Biostatistics (40 cr)	MS Biostatistics with HDS Concentration (40 cr)	MS Biostatistics with SCG Concentration (40 cr)
Core Biostatistics Courses (17 cr)		
BIOST 2025 Biostatistics Seminar - 1 cr BIOST 2039 Biostatistical Methods - 3 cr BIOST 2043 Introduction to Theory 1 – 3 cr BIOST 2044 Introduction to Theory 2 – 3 cr BIOST 2049 Applied Regression Analysis – 3 cr BIOST 2081 Mathematical Methods for Statistics – 3 cr BIOST 2087 Biostatistics Consulting Practicum – 1 cr		
Additional Required Biostatistics Courses (5 cr): BIOST 2050 Longitudinal and Clustered Data - 3cr BIOST 2066 Applied Survival Analysis - 2 cr	Health Data Science Required Courses (5 cr): BIOST 2079: Introductory Statistical Learning for Health Sciences – 2 cr INFSCI 2725 Data Analytics – 3 cr	Statistical and Computational Genomics Required Courses (6 cr): BIOST 2055 Introductory High-throughput Genomic Data Analysis – 2 cr BIOST 2079: Introductory Statistical Learning for Health Sciences – 2 cr HUGEN 2022 Population Genetics – 2 cr
Required Programming Course (2 cr): BIOST 2093 Introduction to SAS Computing - 2 cr	Required Programming Course (2 cr): BIOST 2094 Advanced R Programming – 2 cr	Required Programming Course (2 cr): BIOST 2094 Advanced R Programming – 2 cr
Required School Courses in EPI/Public Health (6 cr)		
EPIDEM 2110 Principles of Epidemiology - 3 cr PUBHLT 2022 Public Health Grand Rounds – 0 credits (required 2 times) PUBHLT 2011 Essentials of Public Health – 3 cr		
Electives (8 cr): BIOST elective credits must be taken to reach a total number course credits of 40. Courses other than BIOST must be approved by the academic advisor.	HDS Electives (8 cr): Elective credits from the following list must be taken to reach a total number course credits of 40. BIOST 2063 Bayesian Data Science – 3 cr BIOST 2093 Introduction to SAS Computing -2 cr BIOST 2080 Advanced Statistical Learning – 2 cr BIOINF 2051 Foundations of Bioinformatics – 3 cr	SCG Electives (7 cr): Elective credits from the following list must be taken to reach a total number course credits of 40. BIOSC 1940/2940 Molecular Biology – 3 credits BIOSC 2140 Genomics – 3 credits CMPBIO 2070 Computational Genomics – 3 credits HUGEN 2070 Bioinformatics for Human Genetics – 3 cr

	<p>INFSCI 2160 Data Mining –3 cr</p> <p>INFSCI 2710 Database Management – 3 cr</p> <p>PHARM 5384 Python for Data Management & Analytics – 3 cr</p> <p>Courses other than those in the above list must be approved by the academic advisor.</p> <p>This list is subject to change as new course become available.</p>	<p>HUGEN 2080 Statistical Genetics – 3 cr</p> <p>Courses other than those in the above list must be approved by the academic advisor.</p> <p>This list is subject to change as new course become available.</p>
Capstone (2 cr)		

- *Elective credits:* The goal of the elective credits is to allow students to individualize their degree. For students who do not enter an area of concentration, the electives will allow them to gain knowledge in a broad range of biostatistical analytic methods whereas for students in HDS and SCG, electives will allow them to focus their specialization further.
- *Course Mapping to Learning Objectives for Areas of Concentration:*
HDS:
 - 1) Transform and map data into proper form for meaningful analyses
 BIOST 2079, INFSCI 2725, INFSCI 2710
 - 2) Apply methods for big data and machine learning to reveal patterns, trends and associations
 BIOST 2063, BIOST 2079, INFSCI 2725, INFSCI 2160
 - 3) Effectively use a programming language (such as R and/or Python) for data management and statistical analysis
 BIOST 2094, PHARM 5384
SCG:
 - 1) Transform and map genomic data into proper form for meaningful analyses
 BIOST 2055, HUGEN 2070
 - 2) Apply appropriate statistical and computational methods for various 'omics data
 BIOST 2055, HUGEN 2022, HUGEN 2080, CMPBIO 2070
 - 3) Effectively use a programming language (such as R) to analyze genomic data
 BIOST 2094, BIOST 2055, HUGEN 2070, HUGEN 2080
- *Comprehensive exam:* All MS students must pass a written comprehensive examination that will be given once annually at the end of the first year of study in early May. The MS comprehensive exam consists of two short answer components: one for theory and one for applied methods. The exam is proctored and closed book. The exam is based on the core Biostatistics courses and the school required Epidemiology course. These classes are the theory sequence of BIOST 2043/BIOST 2044 and the applied sequence of BIOST 2039/2049 and EPIDEM 2110. These courses must be taken (or officially exempted) and passed with a B or better grade prior to taking the exam. Students must pass both components of the exam to meet the milestone for

graduation. Students who fail either part of the examination on the first attempt will be permitted to take that part of the examination a second time. The examination will be offered during the summer after the first year of study only for students who have not passed either part on the first attempt in order not to delay graduation or decisions about continuation in the program. Students who fail either part of the examination on the first attempt may also choose to wait until the following May to retake the necessary part of exam. Per school policy, students will be dismissed from the program after failing the examination twice.

- *Capstone (new course):* Students will take the newly created Capstone course to meet the thesis milestone. The capstone course is a heavily directed and mentored statistical data analysis project leading to an ETD formatted thesis and formal oral presentation of the work. The course format has didactic pieces in the classroom setting with assessments as well as independent work outside of the classroom. There will be weekly feedback given to the students on every assigned assessment. The capstone project may be based on student work with a faculty member, access to a dataset with a research question from an outside source, or work done on a student internship. In addition, if none of these options apply to an individual student, open access datasets from previously funded research projects in the department or open access databases such as Gene Expression Omnibus (<https://www.ncbi.nlm.nih.gov/geo/>) or UCI Machine Learning Repository (<https://archive.ics.uci.edu/ml>) will also be available for students to use. These datasets will change every few terms to allow for project variability. All projects must have a public health focus. This course will be an intense data analysis and writing course with the goal of rigorous analytic methods, appropriately summarized analysis results with logical, statistically and scientifically valid conclusions packaged into an ETD formatted acceptable thesis document. The Capstone course will ensure that the written thesis milestone demonstrates the student's competency in biostatistics (and area of concentration) as well as oral and written communication skills in general. The Capstone will be offered every semester as needed.
- *Internships:* While an internship will not be required, we strongly encourage students to find an internship opportunity over their summer break. Several companies and federal agencies offer summer internship opportunities for MS level students.
- *Schedule of classes:* The standard program is 24-month curriculum but can be compressed into an 18-month curriculum. The 18-month schedule also requires that students enter the program with a strong math background so that BIOST 2081 Mathematical Methods for Statistics does not need to be taken.
- *Enrollment in an area of concentration:* Students will apply to directly to a concentration under the MS in Biostatistics as part of the application process in SOPHAS. Students not applying for a concentration will apply to the main MS in Biostatistics.
- *Declaring area of concentration after enrollment:* Because all students take the core BIOST courses in their first semester, it will be straightforward for students enrolled in the MS Program to apply to an area of concentration at a later date after discussion with their academic advisor and program director. As with other program transfers within the Graduate School of Public Health, because these students will already be students of Pitt Public Health, they will only need

to send notification to Student Affairs that they want to apply to an area of concentration. Application materials will be sent directly to the MS program director who will make a decision on acceptance into the concentration. To allow students who wish to add a concentration to graduate in a timely manner, application to a concentration should occur no later than the Summer term of their first year.

- *Leaving a concentration after enrollment:* A student may decide to change to the MS in Biostatistics without a concentration after enrolling in a concentration. Because these students will already be students of Pitt Public Health, they will only need to send notification to Student Affairs that they want to leave the area of concentration. There will be no application needed as these students will already be in the MS Biostatistics Program. To allow these students to graduate in a timely manner, they should notify the MS program director and Student Affairs that they wish to leave the concentration no later than the Summer term of their first year. Any required classes taken for the concentration can be used as general electives towards the MS degree without concentration.

- *Additional new courses:*

BIOST 2079 Introductory Statistical Learning for Health Sciences This course is required by both HDS and SCG concentrations. It covers modern statistical methods for high-dimensional data analysis such as clustering, machine learning, variable selection and dimension reduction. The course will focus on applications in health and genomic data with multiple hands-on computer lab sessions, homework and final project.

BIOST 2080 Advanced Statistical Learning This course will be a required elective for both HDS and SCG concentrations. As the second course in statistical learning following BIOST 2079, this course will cover in-depth theory and insight behind statistical methods introduced in BIOST 2079.

(3) The effects, if any, that the proposed program will have on other units of the University.

We expect a small positive impact on other units, as the new courses we propose will be of interest to a number of other units within the school and the university (see letters of support). We expect an immediate positive synergy between these programs and other data-focused (but more domain-driven) programs in the Graduate School of Public Health. In addition, the unique public health focus of our HDS concentration will complement other data science programs across the university and ideally lead to cross-registrations and synergies with those programs as well.

(4) A discussion of the budget impact of the program, including both new income and new costs

Our current MS in Biostatistics enrollment is 15 students per year. As described above, we are introducing two new areas of concentration, SCG and HDS. In the first offering of the new areas of concentration, we expect that some current MS students will choose to enroll in one of the proposed areas of concentration. We anticipate that the proposed areas of concentration will bring incremental students in Years 2 and 3. The incremental gross and net tuition are in the table below.

The three new courses being added to our curriculum (Capstone, BIOST 2079, BIOST 2080) will be taught by current faculty at FTEs of 10%. No new faculty will be hired at this time for teaching these particular courses. The Capstone course will be taught by Ada Youk, Jeanine Buchanich and Jenna Carlson. This will be in addition to their current teaching load. BIOST 2079 will be co-taught by George Tseng and Lu Tang. This class is a replacement for a course that Dr. Tseng already teaches so this new course will not increase his teaching load. BIOST 2080 will be taught by Lu Tang. Dr. Tang is currently in protected time fully supported by departmental funds without teaching during the first tenure-track year but will start to teach from the second year. Therefore, the added teaching responsibility will not be an additional expense. Thus, current faculty and staffing are able to meet the demands of the proposed areas of concentration. We view this as a reallocation of resources rather than incremental resources.

We do not anticipate any changes to our current space, facilities or equipment within the Department and School to accommodate the new areas of concentrations. Overall, the new areas of concentration will increase our total tuition dollars brought to the University as well as tuition incentive back to our School and Department.

	Year 1				
	MS in Biostatistics	MS in Statistical and Computational Genomics	MS in Health Data Science	Total	Incremental Students and Tuition \$
# of Students	10	3	5	18	3
Total Tuition*	\$ 398,528	\$ 119,558	\$ 199,264	\$ 717,350	\$ 119,558
Net Tuition Incentive	\$ 267,014	\$ 80,104	\$ 133,507	\$ 480,625	\$ 80,104.13
	Year 2				
	MS in Biostatistics	MS in Statistical and Computational Genomics	MS in Health Data Science	Total	Total
# of Students	10	4	6	20	5
Total Tuition*	\$ 398,528	\$ 159,411	\$ 239,117	\$ 797,056	\$ 199,264
Net Tuition Incentive	\$ 267,014	\$ 106,806	\$ 160,208	\$ 534,028	\$133,506.88
	Year 3				
	MS in Biostatistics	MS in Statistical and Computational Genomics	MS in Health Data Science	Total	Total
# of Students	10	5	10	25	10
Total Tuition*	\$ 398,528	\$ 199,264	\$ 398,528	\$ 996,320	\$ 398,528
Net Tuition Incentive	\$ 267,014	\$ 133,507	\$ 267,014	\$ 667,534	\$267,013.76

*Tuition is assumed to be a 30/70 mix of In-State and Out-of-State students, consistent to our current student population

(5) A list of faculty groups and administrators that have been consulted and a summary of their comments on the proposed program.

We have consulted with several departments and schools across campus to provide feedback for our proposed areas of concentration. We worked with the Paul Cohen, the Dean of the School of Computing and Information (SCI) to assure seats for our Biostatistics students in three Information Sciences courses that will be an integral part of the HDS concentration. We have garnered support from several departments in the School of Medicine (Derek Angus, Chair of Critical Care Medicine and Ivet Bahar, Chair of Computational and Systems Biology), as well as the Institute for Clinical Research Education (Doris Rubio, Director) and Departments of Statistics (Satish Iyengar, Chair) and Biomedical Informatics (Gregory Cooper, Vice Chair). Please see attached letters of support. In addition, we have worked closely with our school's Executive Associate Dean (Eleanor Feingold) and Associate Dean for Education (Jessica Burke) during the creation of this proposal. We have also had discussions with each chair of the departments in our school.



University of Pittsburgh

Department of Biomedical Informatics

The Offices at Baum
5607 Baum Blvd.
Pittsburgh, PA 15206-3701
412-624-5100
Fax: 412-62-5310
www.dbmi.pitt.edu

February 18, 2019

Shyamal Peddada, Ph.D.
Chair, Department of Biostatistics
University of Pittsburgh
7126 Public Health, 130 DeSoto Street
Pittsburgh, PA 15261

Dear Dr. Peddada:

I am writing in support of the Department of Biostatistics at the University of Pittsburgh creating concentrations in Health Data Science (HDS) and the Statistical Computational Genomics (SCG). Increasingly, a wide variety of organizations, including universities, pharmaceutical companies, insurance companies, government agencies, and others are generating complex, high dimensional health and other data that require specialized methods to analyze and process them. Accordingly, many biostatistics departments are modernizing their M.S. and Ph.D. programs in response to these growing demands. The proposal by the Department of Biostatistics to create concentrations in HDS and SCG is therefore very timely and important as a way for the department and the graduate school of public health to train the next generation of biostatisticians.

The Department of Biostatistics is in a strong position to add these concentrations to its curriculum. It has a track record of training outstanding M.S. and Ph.D. students, who are employed in government, pharma, and universities. The department faculty members are highly regarded internationally and have expertise in areas that are relevant to the proposed concentrations, including statistical genomics and high dimensional data analysis. I am aware that the department also has developed (and is developing) several new courses on topics that include Bayesian Data Science, Statistical Machine Learning, and Spatial Data Analysis, which are very relevant to the proposed concentrations. I believe that the new concentrations will increase further the department and school's visibility and the number of strong students who apply and matriculate there. These concentrations will also increase opportunities for training grants and other funding opportunities from federal and other agencies.

In summary, I am delighted that the department is planning to introduce these two new concentrations, and I enthusiastically endorse it doing so.

Sincerely,

A handwritten signature in cursive script that reads "Gregory F. Cooper".

Gregory F. Cooper, M.D., Ph.D.
Professor of Biomedical Informatics and of Intelligent Systems
Vice Chair, Department of Biomedical Informatics
University of Pittsburgh



University of Pittsburgh

School of Medicine
Department of Critical Care Medicine

614 Scaife Hall
3550 Terrace Street
Pittsburgh, PA 15261
412-647-6965
Fax: 412-647-5258
Email: angusdc@upmc.edu
www.ccm.pitt.edu

Derek C. Angus, MD, MPH, FRCP
Distinguished Professor and Chair
The Mitchell P. Fink Endowed Chair
in Critical Care Medicine

To whom it may concern,

Professor Peddada shared with me the proposed curricula for two new MS degrees to be offered by the Department of Biostatistics (one in Health Data Science and the other in Statistical and Computational Genomics). Both these areas are increasingly important in the fields of medicine and the biological sciences. In my role as a department chair in the School of Medicine, I can attest that we are constantly searching for individuals with these skills to join our various research programs. In addition, in my recent role as chair of the search committee for the Chair of Biostatistics (a position now held by Professor Peddada!), it was apparent via my many interactions with the search committee, with a broad swathe of relevant scientists across campus, and with many of the prospective candidates who visited from around the country, that these two areas are emerging priorities deserving of focused study.

As such, it is highly likely that both research institutions and healthcare industries will be increasingly interested in recruiting individuals with Masters level skills in these areas. The proposed programs appear to be contemporary, thoughtful, and led by highly skilled professors. As such, I offer my full endorsement for the programs.

Regards,

A handwritten signature in black ink that reads "Derek C. Angus".

Derek C. Angus, MD, MPH, FRCP
Distinguished Professor and Mitchell P. Fink Endowed Chair
Department of Critical Care Medicine
University of Pittsburgh and UPMC Health System



University of Pittsburgh

School of Medicine
Department of Computational and Systems Biology

3064 Biomedical Science Tower 3
3501 Fifth Avenue
Pittsburgh, PA 15260
412-648-3333
Fax: 412-648-3163
www.csb.pitt.edu

January 10, 2019

Shyamal D. Peddada, PhD
Professor and Chair, Dept. of Biostatistics
University of Pittsburgh
7126 Public Health, 130 DeSoto Street
Pittsburgh, PA 15261

Dear Shyamal:

It is my pleasure to express my full support for your proposal of two new Masters programs, one in Statistical & Computational Genomics and the other in Health Data Science, at the University of Pittsburgh, School of Public Health.

There is a growing demand for educational programs in this area. We recently proposed a Masters degree granting program in the area of Computational Biomedicine and Biotechnology, which will hopefully be approved this month. I believe your programs will nicely complement ours, and I look forward to the opportunity of sharing courses and/or exchanging or co-mentoring students between our programs whenever suitable.

I would like to once again express my enthusiastic support for this important educational endeavor. I look forward to having a strong collaboration between our departments and working together for advancing research and education for training a new generation of researchers/experts in the rapidly emerging fields of quantitative biology, genomics and biomedicine as well as biological and biomedical data science.

Sincerely,

A handwritten signature in cursive script, appearing to read 'I. Bahar'.

Ivet Bahar, PhD
Distinguished Professor and John K. Vries Chair
Department of Computational and Systems Biology
School of Medicine, University of Pittsburgh
3064 BST3, 3501 Fifth Avenue, Pittsburgh, PA 15213
Phone: 1.412.624.7615// Fax: 1.412.648.3163
bahar@pitt.edu // <http://www.csb.pitt.edu/>
Lab: <http://www/csb/pitt.edu./Faculty/bahar/>



Pittsburgh

Institute for Clinical Research Education

Doris M. Rubio, PhD
Director
Associate Vice Provost for Faculty
Professor of Medicine, Biostatistics,
Biomedical Informatics, Nursing, and
Clinical and Translational Science

200 Meyran Avenue, Suite 300, Pittsburgh, PA 15213
412-586-9632 • Fax: 412-586-9672 • www.icre.pitt.edu

March 27, 2019

Dr. Shyamal Peddada, Chair
Department of Biostatistics
Graduate School of Public Health

Dear Shyamal,

The Department of Biostatistics is proceeding very methodically in modernizing the department while maintaining their strengths and reputation in traditional biostatistics. First, they have faculty with appropriate expertise in modern high dimensional data, statistical genomics, and causal inference. Second, they are introducing courses in modern topics such as statistical machine learning, Bayesian data science, spatial models etc. The department already has a very robust international reputation as an academic department with faculty having strong teaching and research programs.

The proposed concentrations in Health Data Science (HDS) and in Statistical and Computational Genomics (SCG) are much needed and very timely. These concentrations are very innovative and contemporary. I believe that changing the name of the department to the Department of Biostatistics and Data Science is appropriate to encompass these foci.

In my view, the department has done an excellent job preparing this proposal. With the proposed new concentrations, the new name of the department and consequently Graduate School of Public Health, are poised to enhance their reputation globally and thus grow in student enrollment and research opportunities.

As the director of the Institute for Clinical Research Education, I am delighted to see the department move in this direction. We often have trainees inquire about training in data science, such as analyzing big data and the use of machine learning to develop algorithms in health care. The concentrations that the department are developing are in harmony with the needs of our trainees. I foresee several of our trainees pursuing training in these areas.

I congratulate the department for their methodical approach in developing these new programs and I very strongly and enthusiastically endorse these programs.

Sincerely,

[Handwritten signature of Doris M. Rubio]

Doris M. Rubio, PhD
Professor of Medicine, Biostatistics, Biomedical Informatics,
Nursing, and Clinical and Translational Science
Director, Institute for Clinical Research Education
Associate Vice Provost for Faculty

Wishwa N. Kapoor, MD, MPH
Founder, Director of Strategic Planning
Distinguished Service Professor and Falk
Professor of Medicine, Health Policy and
Management, and Clinical and
Translational Science
Co-Director, RAND-University of
Pittsburgh Health Institute
Associate Director, Clinical and
Translational Science Institute

Megan E. Miller, MEd
Administrative Director

Programs

Clinical and Translational Science Fellowship (TL1)

Wishwa N. Kapoor, MD, MPH
Director
Kevin L. Kraemer, MD, MSc
Co-Director, Postdoctoral fellowship
Samuel M. Poloyac, PharmD, PhD
Co-Director, Predoctoral fellowship

Clinical and Translational Science Scholars Program (KL2)

Wishwa N. Kapoor, MD, MPH
Director
Doris M. Rubio, PhD
Co-Director

PhD in Clinical and Translational Science

Galen E. Switzer, PhD, MA
Director

Master of Science and Certificate in Clinical Research

Doris M. Rubio, PhD
Director

Master of Science and Certificate in Medical Education

Carla Spagnoletti, MD, MS
Director

Clinical Scientist Track for Residents

Kathleen McTigue, MD, MPH
Director

Clinical Scientist Training Program

Judy C. Chang, MD, MPH
Director

Office for Evaluation

Doris M. Rubio, PhD
Director

Career Education and Enhancement for Health Care Research Diversity

Esa Davis, MD, MPH, FAAFP
Director
Sonya Borrero, MD, MS
Director (Medical Students)

Leading Emerging and Diverse Scientists to Success (LEADS)

Doris M. Rubio, PhD
Director

Expanding National Capacity in PCOR through Training (ENACT)

Doug Landsittel, PhD
Director

Patient-Centered Outcomes Research (PCOR) Scholars Program (K12)

Wishwa N. Kapoor, PhD
Director

International Scholars Track (IST)

Peter D. Bulova, MD
Director

Research Education in Advancing Investigative Careers for Housestaff and Fellows (REACH) Program

Doris M. Rubio, PhD
Director



University of Pittsburgh

*School of Computing and Information
Office of the Dean*

500 Information Sciences Building
135 North Bellefield Avenue
Pittsburgh, PA 15260
412-624-5230
Fax: 412-624-5231
www.sci.pitt.edu

January 14, 2019

To whom it may concern

Dr. Peddada and his colleagues in the Department of Biostatistics are proposing to offer two important MS concentrations, one in Health Data Science (HDS) and other in Statistical and Computational Genomics (SCG). I very strongly and enthusiastically support their efforts and the introduction of these programs.

As noted in their proposals, large volumes of complex high dimensional data are routinely generated in biomedical researchers in research labs, pharmaceuticals, state and federal agencies etc. Mining these data to understand various health related exposures, outcomes or other characteristics of interest requires sophisticated training in biostatistics and computational methods.

The proposed MS in HDS is a very well-conceived training concentration that provides strong foundations for a student to succeed in the job market. There is an urgent need for biostatisticians to mine large public health databases to understand patterns of disease progression or exposure to opioids, environmental toxicants, and so on. Horizontal and vertical integration of such large-scale databases and then to answer scientifically valid questions, requires sophisticated training in modern biostatistical and computational methods, which is accomplished by the MS concentration in HDS. It includes important courses in modern statistical and machine learning methods and Bayesian data science, appropriate computer science courses offered by our School of Computing and Information (SCI), namely, Data Analytics (INFSCI 2725), Data Mining (INFSCI 2160), Database Management (INFSCI 2710), and various electives offered by the Graduate School of Public Health (GSPH) for gaining domain knowledge of interest to the student. To accommodate the students enrolled in the HDS concentration, we have agreed to block space for up to 10 students per semester from the Department of Biostatistics to take INFSCI 2725, INFSCI 2160 and INFSCI 2710, offered by our school. The Department of Biostatistics will similarly block space for up to 10 students per semester from SCI to enroll in Introductory Statistical Learning for Health Sciences (BIOS 2079), Advanced Statistical Learning (BIOS 2080) and Bayesian Data Science (BIOS 2063). The course requirements, together with summer internship experience, will provide a very strong training for a MS student enrolled in this concentration. These students will be highly employable as the job market for health data scientists continues to grow at a very fast rate.

The proposed MS in SCG is also very well thought out concentration that will train students to perform extremely well in the "hot" computational genomics market. Again, as described in their write-up, increasingly, technological advancements in biomedical research is generating complex high-dimensional genomic data. These genomic data play critical role not only in basic biomedical research, but also in pharma in drug discovery research. An important strength of the proposed SCG concentration is that it will train students to think critically about various computational methods used in genomics. The students will not only have strong computational background but will also have the strong statistical background to understand the strengths and limitations of various methods according to the type of data and underlying statistical design. As in the case of the proposed HDS concentration, the course work together with summer internship, will provide a very strong

training for a student enrolled in this concentration. These students will also be highly employable as the job market for computational genomics continues to grow at a very fast rate.

The faculty in the Department of Biostatistics are nationally and internationally renowned experts in their fields. They are highly committed to training and research. The department is introducing important relevant courses as well as hiring faculty with strong research programs and commitment to teaching and mentoring students. Thus, students enrolling into these new programs will receive outstanding contemporary education in two of the hottest fields in terms of the job market. The proposed concentrations are very timely and urgently needed to train the next generation of students in modern biostatistics.

I am also delighted to learn that the department is proposing to change its name from "Department of Biostatistics" to "Department of Biostatistics and Data Science". Given the direction the department is taking and the current trends in public health research, this change of name of the department is also very appropriate and timely.

The proposed concentrations, together with proposed name change, will have a great positive impact on student recruitment not only within the Department of Biostatistics and in the School of Public Health but also overall recruitment to our university. New concentrations such as these send an important message to potential applicants and granting agencies that various units within the university are modernizing their programs and that we are a university on the go. Thus, not only the reputation, visibility and ranking of the Department of Biostatistics will improve but so will the Graduate School of Public Health as well as the University of Pittsburgh.

I strongly endorse and support these two concentrations proposed by the Department of Biostatistics.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Cohen', with a stylized flourish at the end.

Paul R. Cohen
Founding Dean and Professor
School of Computing and Information



University of Pittsburgh

*Department of Statistics
Dietrich School of Arts & Sciences
Pittsburgh, Pennsylvania 15260*

Professor Satish Iyengar
Tel: [412] 624-8341
Fax: [412] 648-8814
Email: ssi@pitt.edu

March 27, 2019

Shyamal Das Peddada, PhD
Chair, Department of Biostatistics
University of Pittsburgh
Pittsburgh, PA 15261

Dear Shyamal,

I am pleased to write in support of your two proposed MS concentrations in Health Data Science (HDS) and Statistical and Computational Genomics (SCG). The need for careful analysis of the huge amounts of complex data, often in high dimensions, is increasingly important in biomedical research. Your proposed programs will help to train the current and next generations of biostatisticians to meet these challenges. The programs are quite comprehensive, with courses across Public Health, Arts and Sciences, and SCI. Furthermore, the thesis requirement gives students an opportunity to focus their training on a particular problem and to sharpen their writing skills.

Given these developments, I think that the proposed name change for your department to the *Department of Biostatistics and Data Science* is timely, and which will surely attract the attention of more potential students and other future prospects.

I wish you all the best with these new developments.

Sincerely,

A handwritten signature in blue ink, appearing to read "Satish Iyengar".

Satish Iyengar
Professor and Chair

PROPOSAL OF NEW PROGRAM PROCEDURE CHECKLIST

A COPY OF THIS CHECKLIST MUST BE SUBMITTED
WITH THE PROPOSAL AT EACH LEVEL

Name of New Proposal

Proposal for Two Areas of Concentration for the MS Degree in Biostatistics:
Health Data Science (HDS)

Name of Faculty and Department Submitting Proposal

Name: Ada Youk Department: Biostatistics

DATE SUBMITTED TO DEPARTMENT CHAIR: 3/27/2019

SIGNATURE AND DATE OF APPROVAL BY DEPARTMENT CHAIR



Shyamal D. Peddada

DATE 3/28/2019

DATE SUBMITTED TO EPCC: 04/05/2019

SIGNATURE AND DATE OF APPROVAL BY EPCC

_____ DATE _____

DATE SUBMITTED TO PBPC _____

SIGNATURE AND DATE OF APPROVAL BY PBPC

_____ DATE _____

DATE SUBMITTED TO Pitt Public Health COUNCIL _____

SIGNATURE AND DATE OF APPROVAL BY PITT PUBLIC HEALTH COUNCIL

_____ DATE _____

DATE SUBMITTED TO SVC/PBC _____

DATE OF APPROVAL BY SVC/PBC _____

DATE OF PRESENTATION GIVEN TO GRADUATE
COUNCIL _____

DATE OF APPROVAL BY PROVOST _____

If this is a new DEGREE, it must be sent to the Council of Trustees.

[] DATE SUBMITTED TO THE COUNCIL OF TRUSTEES _____

[] DATE OF APPROVAL BY THE COUNCIL OF TRUSTEES _____

PROPOSAL OF NEW PROGRAM PROCEDURE CHECKLIST

A COPY OF THIS CHECKLIST MUST BE SUBMITTED
WITH THE PROPOSAL AT EACH LEVEL

Name of New Proposal

Proposal for Two Areas of Concentration for the MS Degree in Biostatistics:
Computational Genomics (SCG)

Name of Faculty and Department Submitting Proposal

Name: Ada Youk Department: Biostatistics

DATE SUBMITTED TO DEPARTMENT CHAIR: 3/27/2019

SIGNATURE AND DATE OF APPROVAL BY DEPARTMENT CHAIR



Shyamal D. Peddada

DATE 3/28/2019

DATE SUBMITTED TO EPCC: 04/05/2019

SIGNATURE AND DATE OF APPROVAL BY EPCC

_____ DATE _____

DATE SUBMITTED TO PBPC _____

SIGNATURE AND DATE OF APPROVAL BY PBPC

_____ DATE _____

DATE SUBMITTED TO Pitt Public Health COUNCIL _____

SIGNATURE AND DATE OF APPROVAL BY PITT PUBLIC HEALTH COUNCIL

_____ DATE _____

DATE SUBMITTED TO SVC/PBC _____

DATE OF APPROVAL BY SVC/PBC _____

DATE OF PRESENTATION GIVEN TO GRADUATE
COUNCIL _____

DATE OF APPROVAL BY PROVOST _____

If this is a new DEGREE, it must be sent to the Council of Trustees.

[] DATE SUBMITTED TO THE COUNCIL OF TRUSTEES _____

[] DATE OF APPROVAL BY THE COUNCIL OF TRUSTEES _____

Educational Policies and Curriculum Committee
Graduate School of Public Health
University of Pittsburgh
(Revised: 6/7/2018)

REQUEST FOR APPROVAL OF NEW COURSES AND COURSE CHANGES

1. **General Instructions:**

- a. Faculty should submit this form and the associated syllabus following the Pitt Public Health Syllabus Guidelines and the Syllabus Checklist (on pages 4 and 5) **by e-mail** to Patricia Documet, Chair (pdocumet@pitt.edu) and Robin Leaf, EPCC Staff Liaison (ral9@pitt.edu). If you choose not to include all the information detailed on the Syllabus Guidelines in your course syllabus for distribution to students, please attach this information to the proposal.
- b. The initiating Department is asked to submit one hard copy of this completed form with the proper signatures, syllabus and other materials (if any) to Robin Leaf in Student Affairs **at least one week prior** to the EPCC meeting. If this target date is not met, the proposal will be deferred for consideration at the next meeting scheduled.
- c. You will be contacted by the EPCC Chair or the EPCC Staff Liaison to schedule a presentation and discussion of your program/course proposal with the Committee, if possible at the next scheduled EPCC meeting.

2. **Review based on the following (check all which apply):**

- | | |
|---|---|
| <input checked="" type="checkbox"/> New course, not previously approved (major) | <input type="checkbox"/> Course modification |
| <input type="checkbox"/> Course title change content | <input type="checkbox"/> Special topics course |
| <input type="checkbox"/> Course placement | <input type="checkbox"/> Pitt Public Health Core |
| <input type="checkbox"/> Cross-listing only | <input type="checkbox"/> Practicum, internship, field |
- (Specify academic unit & course number):

3. **Course designation:**

Course Number: BIOST XXXX: Capstone Credits: 2

4. **Cross-listing:**

If you want to cross-list this course in any other Pitt Public Health department or any other school of the University, specify which department(s) and School(s) and provide brief justification.

5. **Course Instructors:**

(Indicate type of Pitt Public Health faculty appointment,* and percentage of total course time/effort anticipated.

For any instructor who does not hold a Pitt Public Health faculty appointment, indicate her/his title and affiliation.)

a. Principal instructor: Ada Youk, Associate Professor of Biostatistics; 50%

b. Co-instructors (if any):

Jeanine Buchanich, Associate Professor of Biostatistics; 25%

Jenna Carlson, Assistant Professor of Biostatistics; 25%

6. **Statement of the course for *Course Inventory*.** Include purpose of course; summary of prerequisites, if any; general course content; and method of conducting course (e.g., lecture, laboratory, field work, etc.).

The capstone course is a heavily directed and mentored statistical data analysis project course leading to an ETD formatted thesis and formal oral presentation of the work. This course will be an intense data analysis and writing course with the goal of producing an ETD formatted thesis document containing rigorous analytic methods, appropriately summarized analysis results with logical, statistically and scientifically valid conclusions. The Capstone course will ensure that the written thesis milestone demonstrates the student's competency in biostatistics (and area of concentration if applicable) as well as oral and written communication skills in general.

Course learning objectives:

By the end of this course, a student should be able to:

- i. Formulate a research question of interest and translate into clear, testable statistical hypotheses
- ii. Generate an appropriate data analysis plan to answer the question of interest and test their hypotheses
- iii. Justify and carry out appropriate standard modelling procedures using real study data, including model interpretation and assessment of model adequacy
- iv. Develop oral and written communication skills through the description of analytic strategies and the summarization and interpretation of results

7. **Student enrollment criteria/restrictions:**

* The principal instructor for any Pitt Public Health course must have a primary, secondary or adjunct appointment in the school.

- a. Indicate any maximum or minimum number of students and provide justification for this limitation.
- b. If admission is by permission of instructor, state criteria to be applied.
- c. Provide a brief description of any prerequisite skills or knowledge areas that are necessary for students entering this course, including any specific course prerequisites or equivalents.

BIOST MS students only. Must have successfully passed the MS Comprehensive exam.

8. **Course schedule and allocation of hours:**

- a. Number of course hours per session: 2 Sessions per week: 1 Weeks per academic term: 15
- b. Approximate allocation of class time (hours or %) among instructional activities:

Lectures: 70% Seminars _____ Recitations _____ Field work _____ Laboratory _____

Other (specify): self directed analysis 30%

- c. Term(s) course will be offered: Fall Spring Summer Term
Summer Session _____

9. **Grading of student performance:**

Indicate the grading system to be used (A, B, C, etc.; H, S, U); provide statement justifying use of system other than letter grade.

H/S/U utilizing specifications grading

Each assignment is graded as Pass/Fail and must be resubmitted (after receiving feedback) as many as three times within two weeks of the original due date to achieve a Pass. Rubrics will be used for each assignment as well as the oral presentation. An assignment that meets the specifications of the rubric on will be considered a pass.

To receive a U in this course, at least one assignment was not passed within 2 revisions.

To receive an S in this course, all assignments must be passed within 2 revisions.

To receive an H in this course, all assignments must be passed with only 1 revision.

10. **On-line course delivery:**

Indicate the extent to which you will be using on-line instructional methods in teaching this course by checking

all of the options below which apply:

I plan to use the course management aspects of CourseWeb/ Blackboard (or equivalent), e.g., grade book, announcements.

I plan to use the interactive features of CourseWeb/Blackboard (or equivalent), e.g., discussion board, etc.

I have designed the course for remote (off-site) learning with little/no classroom attendance required.

I do not plan to use on-line instruction methods for this course (briefly explain)

11. Relevance of course to academic programs and curricula:

- a. Describe how this course contributes to learning objectives specified for the curriculum of one or more Pitt Public Health degree or certificate programs. Indicate whether course is required for any specified degree or certificate.

This course is required for all MS students in Biostatistics. The capstone course is a heavily directed and mentored statistical data analysis project and writing course leading to an ETD formatted thesis and formal oral presentation of the work. The Capstone course will ensure that the written thesis milestone demonstrates the student's competency in biostatistics (and area of concentration if applicable) as well as oral and written communication skills in general


- b. Describe how this course addresses public health issues involving diversity (gender, race, ethnicity, culture, disability, or family status).

The class uses examples and data sets from studies that examine connections between race, gender and ethnicity with health to motivate and illustrate different regression modelling methods.

12. Signature and date of principal faculty member (include department/program) making request:

Name/Title:  Associate Professor, Biostatistics Date: _03/27/19

13. Signature and date of endorsement of department chairperson:

Name/Title:  Shyamal D. Peddada - Chair, Biostatistics Date: 3/28/19

14. (For cross-listing only)

Signature and date of endorsement of department chairperson:

Name/Title: _____ Date: _____

**Educational Policies and Curriculum Committee
Graduate School of Public Health
University of Pittsburgh
(11/19/2013)**

SYLLABUS CHECKLIST FOR NEW AND REVISED COURSES

Addendum to REQUEST FOR APPROVAL OF NEW COURSES AND COURSE CHANGES FORM

*Objective to assist faculty to ensure syllabus contains the required and necessary elements
to provide students with clear expectations of the course.*

NOTE: * indicates a required element of the syllabus. If N/A is checked or this element is not included
complete the information detailed on page two for all instances.

Syllabus Area	Recommended Detail * Required	Included in Your Syllabus?					
<i>Heading</i>	Course Number*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Course Title*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Course Meeting Time/Day of Week*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Classroom Location*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Faculty Information</i>	Office Location*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Office Hours*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Phone Number*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Email Address*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Teaching Philosophy	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
	Teaching Assistant Contact	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Student Expectations in Classroom</i>	Behavior/ Ground Rules (cell phones off, laptops off, etc.)	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Recording of Lectures	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Course Summary</i>	Course Description*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Learning Objectives*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Materials</i>	Required Textbooks/ Articles/Readings	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Required Software	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>

	Required Equipment (including use of CourseWeb/Blackboard)	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Recommended Material	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>
	Availability of Software for Purchase and/or Use	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Evaluation</i>	Grading Scale*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Grading Criteria/Rubric	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Late Assignment Policy	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Accommodation of Students with Disabilities</i>	Pitt Public Health Statement*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Academic Integrity Policy</i>	Pitt Public Health Statement*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Diversity/ Inclusion Statement</i>	Pitt Public Health Statement	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Schedule</i>	Topics by Session*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Reading and Written Assignments by Session*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Learning Objectives by Session	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
	Test Dates	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>
<i>Additional Resources</i>	Health Sciences Library Liaison Contact Information	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
	Writing Center Contact (if course is writing intensive)	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>

Required Information Not Included

List the Required Detail Not Included	Reason for Not Including

Biostatistics XXXX Capstone

The capstone course is a heavily directed and mentored statistical data analysis project course leading to an ETD formatted thesis and formal oral presentation of the work. This course will be an intense data analysis and writing course with the goal of producing an ETD formatted thesis document containing rigorous analytic methods, appropriately summarized analysis results with logical, statistically and scientifically valid conclusions. The Capstone course will ensure that the written thesis milestone demonstrates the student's competency in biostatistics (and area of concentration if applicable) as well as oral and written communication skills in general.

Course learning objectives:

By the end of this course, a student should be able to:

1. Formulate a research question of interest and translate into clear, testable statistical hypotheses
2. Generate an appropriate data analysis plan to answer the question of interest and test they hypotheses
3. Justify and carry out appropriate standard modelling procedures using real study data, including model interpretation and assessment of model adequacy
4. Develop oral and written communication skills through the description of analytic strategies and the summarization and interpretation of results

Course Director/Instructor (50%):

Ada Youk, Ph.D.
Associate Professor
7129 Public Health
Phone: 412-624-5451
E-Mail: ayouk@pitt.edu

Course Instructors (25% each):

Jeanine Buchanich, Ph.D.
Associate Professor
7132 Public Health
Phone: 412-624-2423
E-Mail: jeanine@pitt.edu

Jenna Carlson, Ph.D.
Assistant Professor
7130 Public Health
Phone: 412-383-0605
E-Mail: jnc35@pitt.edu

Time: TBD

Prerequisite: Passing of MS BLOST Comprehensive Exam

Instructor Office Hours:

TBD

Recommended Text Books:

Textbooks are NOT required

Software:

Students will choose the statistical software they utilize

Grading: H/S/U utilizing specifications grading

Each assignment is graded as Pass/Fail and must be resubmitted (after receiving feedback) as many as two times within two weeks of the original due date to achieve a Pass. Rubrics will be used for each assignment as well as the oral presentation. An assignment that meets the specifications of the rubric on will be considered a pass.

To receive a U in this course, at least one assignment was not passed within 2 revisions.

To receive an S in this course, all assignments must be passed within 2 revisions.

To receive an H in this course, all assignments must be passed with only 1 revision.

Assessments: The following assessments will be given throughout the term to allow students the opportunity to practice and receive feedback. These assessments are not graded, but will allow the instructor to expand or reduce the scope of the students project as well as provide additional support if needed.

1. **Diagnostic Assessment:** This assessment is a combination of a writing performance task and an introduction discussion. At the beginning of class instructors will ask that each student write a brief summary of their understanding of a thesis and what the capstone class is meant to do. Students will submit the document (either hard copy or via Courseweb) after about 10-15 minutes and then the class will discuss. First discussion will focus on student perceptions of the capstone class purpose and then talk about the goals of the course as well as what students need to do to be successful and meet the milestone for their degree. After class, course instructors will edit the submitted summary and return to students with feedback on the writing (not necessarily the content).
2. **Self confidence survey:** This survey will be used at the beginning of the term to assess how the students rate their confidence for completing the thesis project. This will allow the instructors to gauge which students they need to keep a closer watch over and be

more proactive in probing these students for work and knowledge checks.

3. **Project prospectus:** The project prospectus will be given several weeks into the term after the students have selected their projects. Instructors will give a set of questions that each student will address to summarize the research question they have selected and the statistical methods they will use to assess the question in a brief summary report. Instructors will use this information to help reduce or expand the scope of the work. They will also use this information to make sure the student is on the correct path in terms of what will be expected in the thesis.
4. **Knowledge and skills checklist:** This will be used to assess the level of necessary statistical knowledge needed for the student to complete the thesis. Instructors will use the information from the checklist to help reduce or expand the scope of the work.
5. **Case Study Assessments:** There will be four case study articles on Courseweb assigned for reading throughout the semester. For each case study, students will read the article prior to class and will answer directed prompts to paraphrase pieces of research articles during class discussion. Case studies will be used as learning tools for students to see how to properly paraphrase and not plagiarize as well how to properly write each type of section. The focus of each case study is as follows:

Case Study 1 – literature reviews

Case Study 2 – statistical analysis plans

Case Study 3 – summarizing study results

Case Study 4 – synthesizing the research and previous literature into a discussion section with concluding remarks

6. **Mid-Semester Assessment:** Course Survey. This one time survey will assess the following:

Are the case studies and directed paraphrasing activities helpful?

How is the pace of the course?

Has the level of instructor interaction been sufficient?

Do you feel as if you will be able to complete your thesis given the structure and pace of the course?

Information gathered from this survey will allow instructors to adjust the pace or add more instructor interaction and didactic material if necessary.

Assignments: The assignments are writing tasks and analyses of data that will culminate into the final document, which is an ETD formatted thesis as well as an oral presentation of the

thesis.

Assignment 1 - Choose project data and complete the project prospectus. Due before week 3.

Assignment 2 - Formulate research question, submit and get feedback. Due before week 4.

Assignment 3 - Extract necessary data to create an analysis file and generate descriptive statistics to help inform the data analysis plan. Due before week 6.

Assignment 4 - Write literature review for proposed project, submit and get feedback. Due before week 6.

Assignment 5 - Write the statistical analysis plan for project, submit and get feedback. Due before week 7.

Assignment 6 - Submit knowledge and skills checklist. Due before week 7.

Assignment 7 - Follow the analysis plan to complete the necessary analyses. Due before week 10.

Assignment 8 - Prepare a written summary of analysis results from wks 7-9, submit and get feedback. Due before week 11.

Assignment 9 - Write the discussion and conclusion of project work, submit and get feedback. Due before week 12.

Assignment 10 - Prepare ETD document, meet with Joanne in Student Affairs to assess formatting. Due before week 14.

Assignment 11 - Submit ETD document (due before week 15), prepare final presentation, submit and get feedback. Due before week 14.

Thesis

All 11 assignments will lead to the final milestone of the ETD formatted thesis with oral presentation.

Data for Project

The capstone project may be based on student work with a faculty member, access to a dataset with a research question from an outside source, or work done during a student internship. In addition, if none of these options apply to an individual student, open access datasets from previously funded research projects in the department or open access databases will also be available for students to use. All projects must have a public health focus.

Timing

Students will take the capstone in the semester that they intend to graduate. Successfully passing all of the assignments will lead to successful completion of the Capstone. Successful completion of the Capstone will allow the student to pass the final program milestones of

successful thesis submission and thesis defense (oral presentation). Appropriate progress in the Capstone is defined as passing all assignments up through assignment 8 on time. Students who are making appropriate progress, but do not complete assignments 9-11 in a timely fashion, will be given an incomplete grade. Graduation for these students will be delayed until the next semester graduation date. Students who are not making appropriate progress by assignment 9, may consider withdrawal from the course. In the event of withdrawal, students will need to register the following semester for the Capstone and make appropriate progress as defined above.

Accommodation for Students with Disabilities

If you have any disability for which you are requesting an accommodation, please notify the instructor and Disability Resources and Services, 140 William Pitt Union (412-648-7890) during the first two weeks of the term (<http://www.studentaffairs.pitt.edu/drs/>). DRS will verify your disability and determine reasonable accommodations for this course.

Academic Integrity

All students are expected to adhere to the school's standards of academic honesty. Cheating/plagiarism will not be tolerated. The Graduate School of Public Health's policy on academic integrity, which is based on the University policy, is available online in the Pitt Public Health Academic Handbook www.publichealth.pitt.edu/home/academics/academic-requirements. The policy includes obligations for faculty and students, procedures for adjudicating violations, and other critical information. Please take the time to read this policy.

Diversity

The University of Pittsburgh Graduate School of Public Health considers the diversity of its students, faculty, and staff to be a strength and critical to its educational mission. Pitt Public Health is committed to creating and fostering inclusive learning environments that value human dignity and equity. Every member of our community is expected to be respectful of the individual perspectives, experiences, behaviors, worldviews, and backgrounds of others. While intellectual disagreement may be constructive, no derogatory statements, or demeaning or discriminatory behavior will be permitted. If you feel uncomfortable or would like to discuss a situation, please contact any of the following:

- the course instructor;
- the Pitt Public Health Associate Dean for Diversity at 412-624-3506 or nam137@pitt.edu;
- the University's Office of Diversity and Inclusion at 412-648-7860 or <https://www.diversity.pitt.edu/make-report/report-form> (anonymous reporting form).

Sexual Misconduct, Required Reporting, and Title IX

The University is committed to combatting sexual misconduct. As a result, you should know that University faculty and staff members are required to report any instances of sexual misconduct, including harassment and sexual violence, to the University's Title IX office so that the victim may be provided appropriate resources and support options. What this means is that as your professor, I am required to report any incidents of sexual misconduct that are directly reported to me, or of which I am somehow made aware.

There are two important exceptions to this requirement about which you should be aware:
A list of the designated University employees who, as counselors and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here:
www.titleix.pitt.edu/report/confidentiality

An important exception to the reporting requirement exists for academic work. Disclosures about sexual misconduct that are shared as part of an academic project, classroom discussion, or course assignment, are not required to be disclosed to the University's Title IX office.

If you are the victim of sexual misconduct, Pitt encourages you to reach out to these resources:

- Title IX Office: 412-648-7860
- SHARE @ the University Counseling Center: 412-648-7930 (8:30 A.M. TO 5 P.M. M-F) and 412-648-7856 (AFTER BUSINESS HOURS)

If you have a safety concern, please contact the University of Pittsburgh Police, 412-624-2121.

Other reporting information is available here: www.titleix.pitt.edu/report-0

Statement from the Department of Gender, Sexuality, and Women's Studies

[This statement was developed by Katie Pope, Title IX Coordinator, in conjunction with GSWS instructors.]

Biostatistics XXXX Capstone

Course Outline

Week	Learning Objectives	Instructional Activities	Assessments	Assignments
1	1-4	<u>In class</u> : Intro and course description	<u>Diagnostic assessment</u> – writing performance task and introduction discussion	
2	1-3	<u>In class</u> : Introduction of possible data sets with guest speakers to describe each one (this may be more than 1 lecture)		After this class, students will choose their data and complete the project prospectus. Due before week 3.
3	1-2	<u>In class</u> : Case study - how to formulate research question (will have to choose dataset and think about their possible question prior), discuss in class		Formulate research question, submit and get feedback. Due before week 4.
4	1-2	Self-directed		Extract necessary data and generate descriptive statistics to help inform the data analysis plan. Due before week 6.
5	1-2	<u>In class</u> : Discuss and dissect examples of literature reviews	<u>Classroom Assessment</u> - Directed paraphrasing will be used in class to help inform the writing of the literature review.	Write literature review for proposed project, submit and get feedback. Due before week 6.
6	3	<u>In class</u> : Case study – how to write a methods section and statistical analysis plan, given statistical paper, pull out the methods, given different scenarios, write example statistical plans, discuss in class	<u>Classroom Assessment</u> - Directed paraphrasing will be used in class to help inform writing a data analysis plan.	Write the statistical analysis plan for project, submit and get feedback. Due before week 7. Submit knowledge and skills checklist. Due before week 7.
7	3	Self-directed	Mid semester assessment: Course progress survey completed via Courseweb.	Follow the analysis plan to complete the necessary analyses. Due before week 10.
8	3	Self-directed		Follow the analysis plan to complete the necessary analyses. Due before week 10.
9	3	Self-directed		Follow the analysis plan to complete the necessary analyses. Due before week 10.
10	4	<u>In class</u> : Case study - summarizing results, given scenarios, summarize results and discuss in class.	<u>Classroom Assessment</u> - Directed paraphrasing will be used in class to help inform writing analysis results.	Prepare a written summary of analysis results from wks 7-9, submit and get feedback. Due before week 11.
11	4	<u>In class</u> : Case study - discussions/conclusions, given		Write the discussion and conclusion of project work, submit and get feedback.

		scenarios and sets of results, generate concluding remarks, discuss in class.		Due before week 12.
12	4	Self-directed and in class. In class will be practice oral presentations		Prepare EDT document, meet with Joanne in Student Affairs to assess formatting. Due before week 14.
13	4	Self-directed and in class. In class will be practice oral presentations		Submit EDT document (before week 15), prepare final presentation, submit and get feedback. Due before week 14.
14	4	<u>In class:</u> present 20 minute final presentation		
15	4	<u>In class:</u> present 20 minute final presentation		

Educational Policies and Curriculum Committee
Graduate School of Public Health
University of Pittsburgh
(Revised: 6/7/2018)

REQUEST FOR APPROVAL OF NEW COURSES AND COURSE CHANGES

1. **General Instructions:**

- a. Faculty should submit this form and the associated syllabus following the Pitt Public Health Syllabus Guidelines and the Syllabus Checklist (on pages 4 and 5) **by e-mail** to Patricia Documet, Chair (pdocumet@pitt.edu) and Robin Leaf, EPCC Staff Liaison (ral9@pitt.edu). If you choose not to include all the information detailed on the Syllabus Guidelines in your course syllabus for distribution to students, please attach this information to the proposal.
- b. The initiating Department is asked to submit one hard copy of this completed form with the proper signatures, syllabus and other materials (if any) to Robin Leaf in Student Affairs **at least one week prior** to the EPCC meeting. If this target date is not met, the proposal will be deferred for consideration at the next meeting scheduled.
- c. You will be contacted by the EPCC Chair or the EPCC Staff Liaison to schedule a presentation and discussion of your program/course proposal with the Committee, if possible at the next scheduled EPCC meeting.

2. **Review based on the following (check all which apply):**

- | | |
|---|---|
| <input checked="" type="checkbox"/> New course, not previously approved | <input type="checkbox"/> Course modification (major) |
| <input type="checkbox"/> Course title change | <input type="checkbox"/> Special topics course content |
| <input type="checkbox"/> Cross-listing only | <input type="checkbox"/> Pitt Public Health Core Course |
| (Specify academic unit & course number): _____ | <input type="checkbox"/> Practicum, internship, field placement |

3. **Course designation:**

Course Number 2079 (tentative) _____ Title Introductory Statistical Learning for Health Sciences Credits 2

4. **Cross-listing:**

If you want to cross-list this course in any other Pitt Public Health department or any other school of the University, specify which department(s) and School(s) and provide brief justification.

5. **Course Instructors:**

(Indicate type of Pitt Public Health faculty appointment,* and percentage of total course time/effort anticipated. For any instructor who does not hold a Pitt Public Health faculty appointment, indicate her/his title and affiliation.)

- a. Principal instructor: George Tseng, Professor, Department of Biostatistics, 100% effort

* The principal instructor for any Pitt Public Health course must have a primary, secondary or adjunct appointment in the school.

b. Co-instructors (if any): None

6. **Statement of the course for *Course Inventory*.** Include purpose of course; summary of prerequisites, if any; general course content; and method of conducting course (e.g., lecture, laboratory, field work, etc.).

Statistical learning is increasingly gaining importance due to the increase of data volume and dimensionality, especially in health sciences regarding the study of omics data and electronic health records. There is a gap between traditional biostatistical training and the modern need for biostatistical expertise in relation to statistical learning and machine learning techniques and skills. Thus, BIOST 2079 (Introductory Statistical Learning for Health Sciences) is offered jointly with another more advanced sequence BIOST 2080 (Advanced Statistical Learning) to prepare students with introductory and advanced level training in the area of statistical learning, with special focus on applications in health and biomedical sciences.

This course will serve as a required course for the newly developed area of concentrations of master program in Health Data Science (HDS) and Statistical and Computational Genomics (SCG) in the Department of Biostatistics. The key purpose of the course is to provide students from health science backgrounds with training in using statistical learning tools to build informative predictive models and to make data-driven decisions. General course contents include linear regression with regularization, classification, clustering, and dimension reduction. The course will be taught through lectures, followed by homework, computing labs, mid-term exam and a final project. Students enrolling for this course are expected to have taken introductory biostatistical courses (BIOST 2039, 2049 and 2043) and familiar with programming.

7. **Student enrollment criteria/restrictions:**

- a. Indicate any maximum or minimum number of students and provide justification for this limitation.

Class will be limited to a maximum of 25 students. This maximum is chosen to logistically accommodate students in the classroom and effective teaching of computing labs. Priority will be given to students from the Department of Biostatistics and Graduate School of Public Health.

- b. If admission is by permission of instructor, state criteria to be applied.

Permission will be given after the student provides copies of transcripts and syllabi indicating that they have acquired the material covered in the prerequisites through other courses. If a student does not meet the prerequisites, they can be admitted with instructor's permission.

- c. Provide a brief description of any prerequisite skills or knowledge areas that are necessary for students entering this course, including any specific course prerequisites or equivalents.

Prerequisite of this course include BIOST 2039 (Biostatistical Methods), BIOST 2049 (Applied Regression Analysis), BIOST 2043 (Introduction to Statistical Theory 1) or equivalent.

8. **Course schedule and allocation of hours:**

- a. Number of course hours per session 2 Sessions per week 2 Weeks per academic term 8

- b. Approximate allocation of class time (hours or %) among instructional activities:

Lectures 73.33% Seminars _____ Recitations _____ Field work _____ Laboratory _____
Other (specify): Computing labs 13.33%, Exams 6.67%, Final presentation 6.67%

c. Term(s) course will be offered: Fall X Spring _____ Summer Term _____ Summer Session _____

9. **Grading of student performance:**

Indicate the grading system to be used (A, B, C, etc.; H, S, U); provide statement justifying use of system other than letter grade.

The cut-offs for computing letter grades will be: A, 100%-90%; B, 89%-80%; C, 79%-70%; D, 69%-60%; and F, <60%.

10. **On-line course delivery:**

Indicate the extent to which you will be using on-line instructional methods in teaching this course by checking all of the options below which apply:

 X I plan to use the course management aspects of CourseWeb/ Blackboard (or equivalent), e.g., grade book, announcements.

 I plan to use the interactive features of CourseWeb/Blackboard (or equivalent), e.g., discussion board, etc.

 I have designed the course for remote (off-site) learning with little/no classroom attendance required.

 I do not plan to use on-line instruction methods for this course (briefly explain)

11. **Relevance of course to academic programs and curricula:**

- a. Describe how this course contributes to learning objectives specified for the curriculum of one or more Pitt Public Health degree or certificate programs. Indicate whether course is required for any specified degree or certificate.

This course is being introduced to directly address learning objectives for advanced MS and early PhD students in Biostatistics who seek to learn modern modeling techniques for big data sets. This course is a required course for second-year MS students with areas of concentration in Health Data Science (HDS) or Statistical and Computational Genomics (SCG).


- b. Describe how this course addresses public health issues involving diversity (gender, race, ethnicity, culture, disability, or family status).

The course will introduce statistical methods for modeling health science data that are collected from social science, randomized studies and observational studies that are closely related to public health. Most of these studies concern gender, race ethnicity in the analysis and addresses the discrepancy in association or causality of interest due to these factors.

12. **Signature and date of principal faculty member (include department/program) making request:**

Name/Title:  Professor of Biostatistics Date: 3/21/2019

13. **Signature and date of endorsement of department chairperson:**

Name/Title:  / chair Date: 3/21/2019

14. (For cross-listing only)

Signature and date of endorsement of department chairperson:

Name/Title: _____

Date: _____

**Educational Policies and Curriculum Committee
Graduate School of Public Health
University of Pittsburgh
(11/19/2013)**

SYLLABUS CHECKLIST FOR NEW AND REVISED COURSES

Addendum to REQUEST FOR APPROVAL OF NEW COURSES AND COURSE CHANGES FORM

*Objective to assist faculty to ensure syllabus contains the required and necessary elements
to provide students with clear expectations of the course.*

NOTE: * indicates a required element of the syllabus. If N/A is checked or this element is not included
complete the information detailed on page two for all instances.

Syllabus Area	Recommended Detail * Required	Included in Your Syllabus?					
<i>Heading</i>	Course Number*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Course Title*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Course Meeting Time/Day of Week*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Classroom Location*	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Faculty Information</i>	Office Location*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Office Hours*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Phone Number*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Email Address*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Teaching Philosophy	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
	Teaching Assistant Contact	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>
<i>Student Expectations in Classroom</i>	Behavior/ Ground Rules (cell phones off, laptops off, etc.)	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
	Recording of Lectures	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Course Summary</i>	Course Description*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Learning Objectives*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Materials</i>	Required Textbooks/ Articles/Readings	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Required Software	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Required Equipment (including use of CourseWeb/Blackboard)	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Recommended Material	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Availability of Software for Purchase and/or Use	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>

Evaluation	Grading Scale*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Grading Criteria/Rubric	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Late Assignment Policy	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
Accommodation of Students with Disabilities	Pitt Public Health Statement*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
Academic Integrity Policy	Pitt Public Health Statement*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
Diversity/ Inclusion Statement	Pitt Public Health Statement	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
Schedule	Topics by Session*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Reading and Written Assignments by Session*	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>
	Learning Objectives by Session	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
	Test Dates	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
Additional Resources	Health Sciences Library Liaison Contact Information	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
	Writing Center Contact (if course is writing intensive)	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>

Required Information Not Included

List the Required Detail Not Included

Reason for Not Including

List the Required Detail Not Included	Reason for Not Including

BIOST 2079 (tentative) – Introductory Statistical Learning for Health Sciences Fall 2019

Instructor: George Tseng, ScD, Professor of Biostatistics

E-mail: ctseng@pitt.edu

Teaching Assistant: TBD

Office Hours: TBD or by appointment, 7117 Public Health

Lecture Times and Location: Mon and Wed at 2:00-4:00PM for the first half semester in the fall; location to be determined.

Course Description

This 2-credit course is a graduate level course to introduce basic concept and methods for statistical learning with emphasis on modern health science applications. The syllabus includes: linear regression with regularization, supervised machine learning, unsupervised clustering, dimension reduction and other special topics (e.g. Bayesian network and hidden Markov model). Target audience will be second year Biostatistics master students or early PhD students with interests in statistical learning techniques for health science data. Through homework problem sets, computer labs and a final project, students will be trained with hands-on materials to implement methods and interpret results in real applications. The course will meet four hours per week for half a semester.

Prerequisites: BIOST 2039, 2049 and 2043. Students are expected to have programming experiences in R or in some low-level languages such as C, C++, Java and Fortran.

Learning Objectives

At the conclusion of this course, the students should be able to:

- Explain the motivation and insights behind statistical learning methods covered in class.
- Demonstrate basic theory proof for selected fundamental concepts and methods.
- Implement methods to real datasets in health sciences.
- Produce an analysis pipeline and interpret the results in a real application.

Required Textbooks/Articles/Readings

The follow textbook is required (freely downloadable from the author's website; <http://www-bcf.usc.edu/~gareth/ISL/index.html>) and will be used for majority of lectures.

- Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani. An Introduction of Statistical Learning: with Applications in R, Springer, 2013.

The following two books are additional references (also freely downloadable). Relevant lecture notes, slides and reading materials will be made available on CourseWeb.

- Hastie, Tibshirani, Friedman. The Element of Statistical Learning. Springer, 2009. (<https://web.stanford.edu/~hastie/Papers/ESLII.pdf>)
- Bishop. Pattern Recognition and Machine Learning. Springer New York, 2006.

CourseWeb/BlackBoard Instruction

The CourseWeb will serve as an archive of homework, lecture notes, and other materials. Announcements concerning course logistics will also be placed on the webpage.

Programming Software

The course examples and lab code generally use R language (freely available).

Grading Scale and Student Performance Evaluation (Assessments and Weights)

Course grades will be based on a weighted average of,

- Homework assignments 45% (Three homework assignments; each 15%)
- Mid-term exam: 20%
- Final project: 15% final presentation and 20% final report (One class project regarding data analysis problems arising from a real dataset.)

The cut-offs for computing letter grades will be: A, 100%-90%; B, 89%-80%; C, 79%-70%; D, 69%-60%; and F, <60%. Plus-minus grades will be assigned by dividing the respective intervals into thirds. Discussions of homework assignments among students are allowed but each student has to write their own solution. Cheating and plagiarism is strictly not allowed and may be reported to the university. See the University of Pittsburgh's Policy on Academic Integrity at <http://www.provost.pitt.edu/info/ai1.html>

Grading Criteria: Homework will be graded according to the correctness of the answer.

Late Assignment policy:

Full credit will be given for assignments turned in on the due date. The assignment should be turned in before 5pm on the due date.

80% credit for one day late.

Assignments turned into mailbox by 4:30pm the next school day after the due date will have a maximum possible credit of 80%.

50% credit for two days late.

Assignment turned into my mailbox by 4:30pm two school days after the due date will have a maximum credit of 50%.

NO credit given after two days late.

If sickness or emergency, no deduction will be taken if the lecturer is informed before the homework is due.

Homework

There will be 3 homework assignments (mixture of theory proof, simulation and real data application using R). Students will turn-in an electronic copy via Blackboard. *Use white space and include clear comments to make code readable.*

Schedule of Sessions and Assignments

Part I: Linear model and regularization		
8/26	Intro of Statistical Learning and linear regression	ISLR, Ch2, 3
8/28	Linear Model Selection and Regularization I	ISLR, Ch6
9/2	No class (Labor Day)	
9/4	Linear Model Selection and Regularization II HW1 distributed (due on 9/11)	ISLR, Ch6
Part II: Supervised learning		

9/9	Concept for classification and cross validation	ISLR, Ch4, 5
9/11	Tree-Based Methods	ISLR, Ch8
9/16	Support Vector Machines HW2 distributed (due on 9/25)	ISLR, Ch9
9/18	Lab 1	
9/23	Artificial neural network and deep learning	Bishop, Ch5
9/25	Mid-term exam	
Part III: Unsupervised learning		
9/30	Clustering I (hierarchical clustering, K-means, Gaussian mixture model)	ISLR, Ch10.3 Bishop, Ch9.1, 9.2
10/2	Clustering II (estimate K, cluster evaluation)	Material will be provided by lecturer
10/7	Dimension reduction I (PCA, MDS, t-SNE) HW3 distributed (due on 10/16)	ISLR, Ch10.2 ESL, Ch14.8
10/9	Lab 2	
10/14	Additional topic: Bayesian network, hidden Markov model	Bishop, Ch8.1 Bishop, Ch13.2
10/16	Final project presentation	

ISLR: James, Witten, Hastie, Tibshirani. An Introduction to Statistical Learning: with Applications in R. Springer, 2013.
 Bishop: Bishop. Pattern Recognition and Machine Learning. Springer New York, 2006.
 ESL: Hastie, Tibshirani, Friedman. The Element of Statistical Learning. Springer, 2009.

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There are two important exceptions to this requirement about which you should be aware: A list of the designated University employees who, as counselors and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: www.titleix.pitt.edu/report/confidentiality

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- SHARE @ the University Counseling Center: 412-648-7930 (8:30 A.M. TO 5 P.M. M-F) and 412-648-7856 (AFTER BUSINESS HOURS)

If you have a safety concern, please contact the University of Pittsburgh Police, 412-624-2121. Other reporting information is available here: www.titleix.pitt.edu/report-0

Statement from the Department of Gender, Sexuality, and Women's Studies

[This statement was developed by Katie Pope, Title IX Coordinator, in conjunction with GSWS instructors.]

Educational Policies and Curriculum Committee
Graduate School of Public Health
University of Pittsburgh
(Revised: 6/7/2018)

REQUEST FOR APPROVAL OF NEW COURSES AND COURSE CHANGES

1. **General Instructions:**

- a. Faculty should submit this form and the associated syllabus following the Pitt Public Health Syllabus Guidelines and the Syllabus Checklist (on pages 4 and 5) **by e-mail** to Patricia Documet, Chair (pdocumet@pitt.edu) and Robin Leaf, EPCC Staff Liaison (ral9@pitt.edu). If you choose not to include all the information detailed on the Syllabus Guidelines in your course syllabus for distribution to students, please attach this information to the proposal.
- b. The initiating Department is asked to submit one hard copy of this completed form with the proper signatures, syllabus and other materials (if any) to Robin Leaf in Student Affairs **at least one week prior** to the EPCC meeting. If this target date is not met, the proposal will be deferred for consideration at the next meeting scheduled.
- c. You will be contacted by the EPCC Chair or the EPCC Staff Liaison to schedule a presentation and discussion of your program/course proposal with the Committee, if possible at the next scheduled EPCC meeting.

2. **Review based on the following (check all which apply):**

- | | |
|---|---|
| <input checked="" type="checkbox"/> New course, not previously approved | <input type="checkbox"/> Course modification (major) |
| <input type="checkbox"/> Course title change | <input type="checkbox"/> Special topics course content |
| <input type="checkbox"/> Cross-listing only | <input type="checkbox"/> Pitt Public Health Core Course |
| (Specify academic unit & course number): _____ | <input type="checkbox"/> Practicum, internship, field placement |

3. **Course designation:**

Course Number 2080 (tentative) Title Advanced Statistical Learning Credits 2

4. **Cross-listing:**

If you want to cross-list this course in any other Pitt Public Health department or any other school of the University, specify which department(s) and School(s) and provide brief justification.

5. **Course Instructors:**

(Indicate type of Pitt Public Health faculty appointment,* and percentage of total course time/effort anticipated. For any instructor who does not hold a Pitt Public Health faculty appointment, indicate her/his title and affiliation.)

a. Principal instructor: Lu Tang, Department of Biostatistics, 100% effort

b. Co-instructors (if any): None

* The principal instructor for any Pitt Public Health course must have a primary, secondary or adjunct appointment in the school.

6. **Statement of the course for *Course Inventory*.** Include purpose of course; summary of prerequisites, if any; general course content; and method of conducting course (e.g., lecture, laboratory, field work, etc.).

Statistical learning is increasingly gaining importance due to the increase of data volume and dimensionality, especially in health science regarding the study of omics data and electronic health records. There is a gap between traditional biostatistical training and the modern need for biostatistical expertise in relation to statistical learning and machine learning techniques and skills. Thus, BIOST 2080 (Advanced Statistical Learning) is offered jointly with another course BIOST 2079 (Introductory Statistical Learning in Health Sciences) to prepare students with introductory and advanced level training in the area of statistical learning, with special focus on applications in health and biomedical sciences. This course will also serve as an elective course for the newly development concentration in health data science in the Department of Biostatistics. The key purpose of the course is to provide students from health science backgrounds training in using statistical learning tools to build informative predictive models and to make data-driven decisions. General course contents include supervised machine learning, unsupervised machine learning, reinforcement learning. The course will be taught through lectures, followed by homework and reading assignments. Students enrolling for this course are expected to have taken BIOST 2049, BIOST 2079, and at least one course in programming.

7. **Student enrollment criteria/restrictions:**

- a. Indicate any maximum or minimum number of students and provide justification for this limitation.

Class will be limited up to 25 students. This maximum is chosen to logistically accommodate students in the classroom. Priority will be given to students from the Department of Biostatistics.

- b. If admission is by permission of instructor, state criteria to be applied.

Permission will be given after the student provides copies of transcripts and syllabi indicating that they have acquired the material covered in the prerequisites through other courses. If a student does not meet the prerequisites, they can be admitted with instructor's permission.

- c. Provide a brief description of any prerequisite skills or knowledge areas that are necessary for students entering this course, including any specific course prerequisites or equivalents.

Prerequisite of this course include BIOST 2049 (Applied Regression Analysis), BIOST 2079 (Introductory Statistical Learning for Health Science) or equivalent.

Programming skills/training shall be demonstrated by previous programming (or programming heavy) courses in R, Python, Matlab, C/C++, etc. Examples include, but not limited to, BIOST 2063, 2079, 2094, INFSCI 0017, 0419, STAT 1361, 2360.

8. **Course schedule and allocation of hours:**

- a. Number of course hours per session 2 Sessions per week 2 Weeks per academic term 8

- b. Approximate allocation of class time (hours or %) among instructional activities:

Lectures 90% Seminars _____ Recitations _____ Field work _____ Laboratory _____
Other (specify): Presentation of research papers 10% _____

- c. Term(s) course will be offered: Fall _____ Spring X Summer Term _____ Summer Session _____

9. **Grading of student performance:**

Indicate the grading system to be used (A, B, C, etc.; H, S, U); provide statement justifying use of system other than letter grade.

The cut-offs for computing letter grades will be: A, 100%-90%; B, 89%-80%; C, 79%-70%; D, 69%-60%; and F, <60%.

10. **On-line course delivery:**

Indicate the extent to which you will be using on-line instructional methods in teaching this course by checking all of the options below which apply:

I plan to use the course management aspects of CourseWeb/ Blackboard (or equivalent), e.g., grade book, announcements.

I plan to use the interactive features of CourseWeb/Blackboard (or equivalent), e.g., discussion board, etc.

I have designed the course for remote (off-site) learning with little/no classroom attendance required.

I do not plan to use on-line instruction methods for this course (briefly explain)

11. **Relevance of course to academic programs and curricula:**

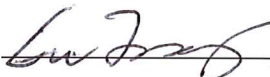
- a. Describe how this course contributes to learning objectives specified for the curriculum of one or more Pitt Public Health degree or certificate programs. Indicate whether course is required for any specified degree or certificate.

This course is being introduced to directly address learning objectives for advanced MS and PhD students in Biostatistics who seek to learn modern modeling techniques for big data sets. This course is an elective for the MS and PhD degree in Biostatistics.


- b. Describe how this course addresses public health issues involving diversity (gender, race, ethnicity, culture, disability, or family status).

The course will introduce statistical methods for modeling health science data that are collected from social science, randomized studies and observational studies that are closely related to public health. Most of these studies concern gender, race ethnicity in the analysis and addresses the discrepancy in association or causality of interest due to these factors.

12. **Signature and date of principal faculty member (include department/program) making request:**

Name/Title:  Assistant Professor of Biostatistics Date: 3/21/2019

13. **Signature and date of endorsement of department chairperson:**

Name/Title:  Date: 3/21/2019

14. (For cross-listing only)

Signature and date of endorsement of department chairperson:

Name/Title: _____ Date: _____

**Educational Policies and Curriculum Committee
Graduate School of Public Health
University of Pittsburgh
(11/19/2013)**

SYLLABUS CHECKLIST FOR NEW AND REVISED COURSES

Addendum to REQUEST FOR APPROVAL OF NEW COURSES AND COURSE CHANGES FORM

Objective to assist faculty to ensure syllabus contains the required and necessary elements to provide students with clear expectations of the course.

NOTE: * indicates a required element of the syllabus. If N/A is checked or this element is not included complete the information detailed on page two for all instances.

Syllabus Area	Recommended Detail * Required	Included in Your Syllabus?					
<i>Heading</i>	Course Number*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Course Title*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Course Meeting Time/Day of Week*	Yes	<input checked="" type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
	Classroom Location*	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Faculty Information</i>	Office Location*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Office Hours*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Phone Number*	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
	Email Address*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Teaching Philosophy	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
	Teaching Assistant Contact	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>
<i>Student Expectations in Classroom</i>	Behavior/ Ground Rules (cell phones off, laptops off, etc.)	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
	Recording of Lectures	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Course Summary</i>	Course Description*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Learning Objectives*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Materials</i>	Required Textbooks/ Articles/Readings	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Required Software	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Required Equipment (including use of CourseWeb/Blackboard)	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Recommended Material	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Availability of Software for Purchase and/or Use	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>

Evaluation	Grading Scale*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Grading Criteria/Rubric	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Late Assignment Policy	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
Accommodation of Students with Disabilities	Pitt Public Health Statement*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
Academic Integrity Policy	Pitt Public Health Statement*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
Diversity/ Inclusion Statement	Pitt Public Health Statement	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
Schedule	Topics by Session*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Reading and Written Assignments by Session*	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
	Learning Objectives by Session	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
	Test Dates	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>
Additional Resources	Health Sciences Library Liaison Contact Information	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
	Writing Center Contact (if course is writing intensive)	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>

Required Information Not Included

List the Required Detail Not Included

Reason for Not Including

List the Required Detail Not Included	Reason for Not Including

BIOST 2080 – Advanced Statistical Learning Spring 2020

Instructor: Lu Tang, PhD, Assistant Professor of Biostatistics

E-mail: lutang@pitt.edu

Office Hours: TBD (1.5 hours/week) or by appointment, 7124 Public Health

Lecture Times and Location: TBD (2 hours/meeting, 2 meetings/week, for half semester 8 weeks)

Course Description

This is a 2-credit course in advanced statistical learning, covering topics related to the statistical interpretation and theory behind machine learning models/methods. Emphases will be given to in-depth derivation of models/algorithms from topics covered in BIOST 2079 (Introductory Statistical Learning for Health Sciences) as well as additional topics on modern statistical learning methodologies, with special focus on methods for health science applications. This course is designed for graduate students in the Department of Biostatistics and other interested graduate students who already have sufficient statistical and programming background. This course will meet four hours per week for half a semester.

Prerequisite of this course include BIOST 2049 (Applied Regression Analysis) and BIOST 2079 (Introductory Statistical Learning for Health Sciences) or equivalent, or consent of instructor.

Students are expected to be familiar with R. Experience in C/C++, Python or Matlab may be helpful, but is not required. Programming skills/training shall be demonstrated by previous programming (or programming heavy) courses in R, Python, Matlab, C/C++, etc. Examples include, but not limited to, BIOST 2063, 2079, 2094, INFSCI 0017, 0419, STAT 1361, 2360.

Learning Objectives

At the conclusion of this course, the student should be able to:

- Describe and derive functional objectives and formulation of a variety of common supervised and unsupervised algorithms covered in the course.
- Reproduce the mathematical techniques and estimation procedures for model-based and heuristic statistical learning methods.
- Apply advanced statistical learning tools and statistical learning theory in Biostatistical applications.
- Implement advanced and reproducible machine learning pipelines for real applications.

Required Textbooks/Articles/Readings

There is no required textbook. Relevant lecture notes, slides and reading materials will be made available on CourseWeb. The following books are recommended references:

- James, Witten, Hastie, Tibshirani. An Introduction to Statistical Learning: with Applications in R. Springer, 2013.
- Hastie, Tibshirani, Friedman. The Element of Statistical Learning. Springer, 2009.
- Bishop. Pattern Recognition and Machine Learning. Springer New York, 2006.
- Sutton, Barto. Reinforcement Learning: An Introduction. MIT Press, Cambridge, 2018.

CourseWeb/BlackBoard Instruction

The CourseWeb will serve as an archive of homework, lecture notes, and other materials. Announcements concerning course logistics will also be placed on the webpage.

Programming Software

Using R or Python is recommended (both freely available).

Grading Scale

Course grades will be based on the following scale:

90-100%	A
80-89%	B
70-79%	C
60-69%	D
< 60%	F

Student Performance Evaluation (Assessments and Weights)

Homework (100%). There will be 4 homework/project assignments, weighted 25% each, on the theoretical topics of the lectures as well as on implementation of numerical algorithms to solve real data example problems. Homework should be completed individually. Solutions will be graded on both correctness and clarity.

Students are encouraged to form teams to discuss proofs and programming algorithms. If so, they will be required to acknowledge their teammates' contributions at the beginning of their submitted homework. Each student must independently write and implement their own solution. Solutions will be graded on both correctness and clarity. Credits will be given for trying to identifying the gaps in argument if complete solution cannot be derived.

Homework turned in late will be discounted accordingly: 80% if 0-1 days past due, 50% if 1-2 days, 0% if later than 2 days. Exception is allowed in case of sickness or emergency, given that the instructor is informed before due dates.

Schedule of Sessions and Assignments

* Topics not final

Lecture	Title	Topics
Part I: Supervised Statistical Learning (Two homework assignments)		
1/7	Introduction	Screening, calling importance, FWER, FDR,
1/9	Regression analysis I	Least square with constraints, likelihood with constraints, best subset selection, stepwise selection, LASSO and ridge regression.
1/14	Regression analysis II	Coordinate descent, lars, Danzig selector; other: elastic net, bridge, SCAD, adaptive lasso, group lasso, fused lasso.
1/16	Model selection and inference	AIC, BIC, Cross-validation, bias-variance trade-off, bootstrap, model selection uncertainty.
1/21	Classification I	LDA, QDA, naïve Bayes, logistic regression.
1/23	Classification II	Classification tree, regression tree, SVM and kernel SVM, kernel trick.
1/28	Boosting and ensemble learning	Bagging, boosting, random forest.
Part II: Unsupervised Statistical Learning (One homework assignment)		
1/30	Cluster analysis I	Similarity metrics, Gaussian mixture.

2/4	Cluster analysis II	K-means, K-medoids, hierarchical clustering.
2/6	Principal components	PCA, sparse PCA, kernel PCA, latent variables and factor analysis, topic modeling.
2/11	Graphical models	Undirected graph, Bayesian networks, HMMs, DAG, MRF.
Part III: Reinforcement Learning (One homework assignment)		
2/13	Multi-arm bandits	Search algorithm, initialization.
2/18	Markov decision process	Markov property, MDP, policy learning, dynamic programming.
2/20	Artificial neural network	Back propagation algorithm.
2/25	Discussion and summary	
2/27	Discussion and summary II	

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Statement from the Department of Gender, Sexuality, and Women's Studies
[This statement was developed by Katie Pope, Title IX Coordinator, in conjunction with GSWS
instructors.]

Educational Policies and Curriculum Committee
Graduate School of Public Health
University of Pittsburgh
(Revised: 6/7/2018)

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- b. The initiating Department is asked to submit one hard copy of this completed form with the proper signatures, syllabus and other materials (if any) to Robin Leaf in Student Affairs **at least one week prior** to the EPCC meeting. If this target date is not met, the proposal will be deferred for consideration at the next meeting scheduled.
- c. You will be contacted by the EPCC Chair or the EPCC Staff Liaison to schedule a presentation and discussion of your program/course proposal with the Committee, if possible at the next scheduled EPCC meeting.

2. **Review based on the following (check all which apply):**

- | | |
|---|---|
| <input checked="" type="checkbox"/> New course, not previously approved | <input type="checkbox"/> Course modification (major) |
| <input type="checkbox"/> Course title change | <input type="checkbox"/> Special topics course content |
| <input type="checkbox"/> Cross-listing only | <input type="checkbox"/> Pitt Public Health Core Course |
| (Specify academic unit & course number): _____ | <input type="checkbox"/> Practicum, internship, field placement |

3. **Course designation:**

Course Number: **BCHS 25XX**
Title: **HARM REDUCTION APPROACHES IN HEALTH AND PUBLIC HEALTH SETTINGS**
Credits: **1.5**

4. **Cross-listing:**

School of Social Work: Topics discussed in this course are highly relevant to the practice of social work and in fact build on social work concepts. In addition, focusing this class on the intersection of public health and social work creates opportunities for synergy in practice and policy development between these two fields.

5. **Course Instructors:**

- a. Principal instructor: **Mary Hawk, Associate Professor, full (100%) responsibility for this course**
- b. Co-instructors (if any):

6. **Statement of the course for *Course Inventory*.**

The aims of this seven week course are to introduce students to harm reduction (HR) principles as a conceptual approach to care rather than simply as a set of strategies, like syringe exchange, and to challenge them to consider how HR-informed approaches to care may improve participant and provider outcomes. The course will incorporate a number of speakers who will address the application of HR in practice. The course incorporates skills-building and strategy development opportunities to support the integration of HR approaches to care across a variety of settings. Course content includes lectures, guest-lectures, and in-class discussions. Grades will be assigned based on participation, the completion of two written assignments, student-led discussions of journal articles, and a brief in-class presentation.

7. **Student enrollment criteria/restrictions:**

a. Indicate any maximum or minimum number of students and provide justification for this limitation.

The class should have between 8-25 students to enable rigorous classroom participation and discussion.

b. If admission is by permission of instructor, state criteria to be applied.

n/a

c. Provide a brief description of any prerequisite skills or knowledge areas that are necessary for students entering this course, including any specific course prerequisites or equivalents.

n/a

8. **Course schedule and allocation of hours:**

a. Number of course hours per session: **3**

Sessions per week: **1**

Weeks per academic term: **7**

b. Approximate allocation of class time (hours or %) among instructional activities:

Lectures: **100%** Seminars _____ Recitations _____ Field work _____ Laboratory _____

Other (specify): _____

c. Term(s) course will be offered: Fall **X** Spring _____ Summer Term _____ Summer Session _____

9. **Grading of student performance:**

Indicate the grading system to be used (A, B, C, etc.; H, S, U); provide statement justifying use of system other than letter grade.

Percentage Points	Letter
90-100	A
80-89	B
70-79	C
60-69	D
Below 60	E

10. **On-line course delivery:**

Indicate the extent to which you will be using on-line instructional methods in teaching this course by checking all of the options below which apply:

X I plan to use the course management aspects of CourseWeb/ Blackboard (or equivalent), e.g., grade book, announcements.

X I plan to use the interactive features of CourseWeb/Blackboard (or equivalent), e.g., discussion board, etc.

___ I have designed the course for remote (off-site) learning with little/no classroom attendance required.

___ I do not plan to use on-line instruction methods for this course (briefly explain)

11. **Relevance of course to academic programs and curricula:**

a. Describe how this course contributes to learning objectives specified for the curriculum of one or more Pitt Public Health degree or certificate programs. Indicate whether course is required for any specified degree or certificate.

While this course is not required for any degree or certificate, it addresses the following core competencies for the Master of Public Health degree:

- Identify basic theories, concepts and models from a range of social and behavioral disciplines that are used in public health research and practice.
- Identify the causes of social and behavioral factors that affect health of individuals and populations.
- Describe the role of social and community factors in both the onset and solution of public health problems.
- Describe the merits of social and behavioral science interventions and policies.
- Apply evidence-based approaches in the development and evaluation of social and behavioral science interventions.
- Apply ethical principles to public health program planning, implementation and evaluation.
- Specify multiple targets and levels of intervention for social and behavioral science programs and/or policies.

b. Describe how this course addresses public health issues involving diversity (gender, race, ethnicity, culture, disability, or family status).

Because HR emphasizes the value of “meeting the client where they are,” it provides the opportunity for the student to consider ways in which policies, programs, and approaches to care are optimally designed to be inclusive of people and populations with various needs, cultures, and histories in public health and healthcare. Moreover, it is designed to challenge the student to explore practices that serve as barriers to care for vulnerable populations.

12. **Signature and date of principal faculty member (include department/program) making request:**

Name/Title: MEHAWK

Date: 3/31/2019

13. **Signature and date of endorsement of department chairperson:**

Name/Title: _____

Date: _____

14. (For cross-listing only)

Signature and date of endorsement of department chairperson:

Name/Title: _____

Date: _____

**Educational Policies and Curriculum Committee
Graduate School of Public Health
University of Pittsburgh
(11/19/2013)**

SYLLABUS CHECKLIST FOR NEW AND REVISED COURSES

Addendum to REQUEST FOR APPROVAL OF NEW COURSES AND COURSE CHANGES FORM

Objective to assist faculty to ensure syllabus contains the required and necessary elements to provide students with clear expectations of the course.

NOTE: * indicates a required element of the syllabus. If N/A is checked or this element is not included complete the information detailed on page two for all instances.

Syllabus Area	Recommended Detail * Required	Included in Your Syllabus?					
<i>Heading</i>	Course Number*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Course Title*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Course Meeting Time/Day of Week* (TBD)	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Classroom Location* (TBD)	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Faculty Information</i>	Office Location*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Office Hours*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Phone Number*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Email Address*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Teaching Philosophy	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Teaching Assistant Contact	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>
<i>Student Expectations in Classroom</i>	Behavior/ Ground Rules (cell phones off, laptops off, etc.)	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Recording of Lectures	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Course Summary</i>	Course Description*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Learning Objectives*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
<i>Materials</i>	Required Textbooks/ Articles/Readings	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Required Software	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>
	Required Equipment (including use of CourseWeb/Blackboard)	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Recommended Material	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Availability of Software for	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>

	Purchase and/or Use						
Evaluation	Grading Scale*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Grading Criteria/Rubric (TBD)	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Late Assignment Policy	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
Accommodation of Students with Disabilities	University Statement*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
Academic Integrity Policy	Pitt Public Health Statement*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
Diversity/ Inclusion Statement	Pitt Public Health Statement*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
Title IX Statement	University Statement*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
Schedule	Topics by Session*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Reading and Written Assignments by Session*	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Learning Objectives by Session	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
	Test Dates	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>
Additional Resources	Health Sciences Library Liaison Contact Information	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>
	Writing Center Contact (if course is writing intensive)	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>

Required Information Not Included

List the Required Detail Not Included

Reason for Not Including

BCHS 2XXX: HARM REDUCTION APPROACHES IN HEALTH AND PUBLIC HEALTH SETTINGS
UNIVERSITY OF PITTSBURGH GRADUATE SCHOOL OF PUBLIC HEALTH
Fall 2019 • 1.5 Credit Hours
Location, Day, Time TBD

Instructor

Mary Hawk, DrPH, LSW
6120 Parran Hall
Phone: 412.648.2342 • Email: mary.hawk@pitt.edu
Office Hours: By appointment

ABOUT THIS CLASS

Course Description & Rationale

The aims of this seven week course are to introduce students to harm reduction (HR) principles as a conceptual approach to care rather than simply as a set of strategies, like syringe exchange, and to challenge them to consider how HR-informed approaches to care may improve participant and provider outcomes. The approach to care builds from lessons learned from community and provider settings that have demonstrated success in engaging and caring for marginalized populations including those who use substances. However, this course extends the conversation about harm reduction to aspects of care that can promote health improvement among all patient and client populations, not just those who use drugs. Concepts that will be discussed include universal harm reduction and herd harm reduction. The course will incorporate a number of speakers who will address the application of HR in specific settings.

Health Equity

The course incorporates skills-building and strategy development opportunities to support the integration of HR approaches to care across a variety of settings. Because HR emphasizes the value of “meeting the client where they are,” this course provides the opportunity for the student to consider ways in which policies, programs, and approaches to care are optimally designed to be inclusive of people and populations with various needs, cultures, and histories in public health and healthcare. Moreover, it is designed to challenge the student to explore practices that serve as barriers to care for vulnerable populations.

Teaching Philosophy

I believe that learning and teaching should be engaging, and should include the acquisition of “real world” lessons and skills. *Facilitating student achievement of these skills and igniting interest in the field are investments in public health and social work.* The diversity of experiences and backgrounds that we all bring enriches the educational potential of every discussion, and for this reason, classroom engagement is critical. In addition, I believe that each student is ultimately responsible for the depth of their own learning. Thus, actively preparing for and engaging in class discussions are critical to mastering the stated learning objectives, and frankly, enjoying class.

Learning Objectives

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

- Define harm reduction and harm reduction approaches to care.
- Discuss the history of harm reduction and an overview of research findings specific to harm reduction studies.

- Identify sources of their own intellectual, emotional, and values-based responses to the practice of harm reduction.
- Identify the degree to which harm reduction is consistent with their own philosophies of care, and develop opportunities to resolve ambivalence regarding inconsistencies.
- Discuss harm reduction approaches that fit within one’s own philosophies of care and can be applied in their own practice settings.
- Describe opportunities and develop strategies to apply harm reduction approaches across a range of treatment, provider, human service, and policy settings.
- Conduct a review of organizational and other policies to explore their consistency with harm reduction strategies.
- Identify local and national resources to support harm reduction practice and continued learning.
- Identify next steps in continuing their own learning and skills development.

Texts & Readings

There are no required texts for this class. Readings will be posted to CourseWeb and are referenced on page 13 of this syllabus.

Student Performance Evaluation (Factors and Weights)

Grades will be assigned based on:

- Assignment #1 – Reflective Paper (20%)
- Assignment #2 – Policy Review (25%)
- Journal Article Discussion (20%)
- Final Presentation (10%)
- Class Participation (25%)

Additional information regarding assignments begins on page 6 of this syllabus.

Participation Policy

The extent of your learning in this class will be greatly enhanced by your preparation for, and participation in, class activities. Each student will be able to gain 25% of their grade in participation points. For each class in which you demonstrate engagement (thoughtfully contributing ideas, active listening, exploring the instructors’ or your peers’ contributions) you earn 20 points (up to 100 points over the 7 weeks of class. Because students have varying levels of comfort speaking up in class, a Discussion Board is also available for students to share ideas. Ten points are deducted from earned participation points for every missed class without reasonable cause.

Grading Scale

Percentage Points	Letter
90-100	A
80-89	B
70-79	C
60-69	D
Below 60	E

CLASS ASSIGNMENTS – GENERAL INFORMATION

CourseWeb/BlackBoard Instruction

CourseWeb will be utilized to share information about the course, both in terms of relaying information to you and obtaining feedback from you. This is also where you will upload assignments and where I will post grades.

Deadlines

Assignments are to be submitted electronically **before midnight on the dates indicated, which are always on Thursday night**. To be absolutely clear, this means that 12:01 a.m. on Friday is late. Assignments will be assessed a 5% deduction for every day they are late. **Assignments will not be accepted more than two days late except in extreme circumstances, to be discussed with the instructor.** Except in emergency circumstances, asking for an exemption of the late submission penalty after the fact is not acceptable.

Submitting Assignments

All assignments should be uploaded in the course folders on CourseWeb. The assignments are uploaded via SafeAssign, which is a useful plagiarism checker. Please save your assignments as Word documents named as your last name plus the assignment name, (e.g. Brown.ReflectionPaper). **Points will be deducted if naming conventions are not followed.** Also note that you are responsible for ensuring that your assignment is successfully uploaded on CourseWeb before the deadline. Do not log out of CourseWeb until you see that your assignment has been successfully uploaded.

All assignments should be double-spaced, Times New Roman 12 point font, with one-inch margins. Please be sure to cite appropriately, using APA Style as described here: <http://pitt.libguides.com/citationhelp/APA>.

Plagiarism

As noted above, all assignments are submitted in SafeAssign, which is a powerful plagiarism checker. I've chosen to use this tool because it's really very easy to plagiarize, and I want you to be able to review your own work to make sure it's cited appropriately. Here are some resources to help you avoid this error (and to reduce your stress around this topic.) I highly recommend use of a citation generator like Endnote.

- *How not to Plagiarize*
<http://en.writecheck.com/ways-to-avoid-plagiarism/>
- *Pitt Public Health Academic Integrity Module*
http://www.publichealth.pitt.edu/Portals/0/Main/Academics/Resource_Page_for_Students_Module.pdf
- Endnote for Students (available for free download via Pitt Software Download Service)
<http://technology.pitt.edu/software/endnote-students>

Diversity Statement

In this course, students, faculty and guests represent a diversity of individual perspectives, backgrounds, and experiences, which enriches the classroom environment. I am aware that learned experiences and cultural norms may inhibit some people from speaking up and it is critical that we all challenge these norms, which in

turn inhibit the full embracing of diversity. I expect students to join this challenge with me by listening to and encouraging input from their peers.

The University of Pittsburgh Graduate School of Public Health considers the diversity of its students, faculty, and staff to be a strength and critical to its educational mission. Pitt Public Health is committed to creating and fostering inclusive learning environments that value human dignity and equity. Every member of our community is expected to be respectful of the individual perspectives, experiences, behaviors, worldviews, and backgrounds of others. While intellectual disagreement may be constructive, no derogatory statements, or demeaning or discriminatory behavior will be permitted.

If you feel uncomfortable or would like to discuss a situation, please contact any of the following:

- the course instructor;
- the Pitt Public Health Associate Dean for Diversity at 412-624-3506 or nam137@pitt.edu;
- the University's Office of Diversity and Inclusion at 412-648-7860 or
- <https://www.diversity.pitt.edu/make-report/report-form> (anonymous reporting form).

Writing Center & Library Support

The University offers help through its Writing Center (412.624.6556). Only a small percentage of students and professionals have truly strong writing skills, and those skills are necessary not only to receive an A in this class, but also to be a skilled and successful proposal-writer. Consider visiting the Writing Center. Doing so should not be thought of as a sign of a deficiency, but rather taken as an opportunity to strengthen the skills you already have. In the unlikely event you need help finding library sources, the BCHS/GSPH Health Sciences Library Liaison is Barb Folb (folb@pitt.edu). You are encouraged to use her as a valuable resource if you get stuck.

Accommodation for Students with Disabilities

If you have any disability for which you may require accommodation, you are encouraged to notify both your instructors and the Office of Disability Resources and Services, 216 William Pitt Union (412-648-7890) during the first two weeks of the term.

Academic Integrity

All students are expected to adhere to the school's standards of academic honesty. Cheating/plagiarism will not be tolerated. The Graduate School of Public Health's policy on academic integrity, which is based on the University policy, is available online in the Pitt Public Health Academic Handbook www.publichealth.pitt.edu/home/academics/academic-requirements.

The policy includes obligations for faculty and students, procedures for adjudicating violations, and other critical information. Please take the time to read this policy.

The nature of this class requires that everyone be focused on discussion and interaction with the instructor, special guests, and other students. Use of electronic devices other than for note taking is not allowed. Class content can be recorded only with the permission of the instructor.

Weekly Sessions and Assignments

Due/Doing	What should I read?	Objectives At the completion of this session students should be able to:
Week 1 - August 29: Course Introduction and History of HR		
Top Hat (In Class activity): Incongruence Between Beliefs and Intentions to Intervene	(Ashton & Seymour, 2010; Hawk et al., 2017)	<ul style="list-style-type: none"> • Discuss the history of HR and HR concepts, including <i>HR Principles for Healthcare Settings</i>. • Describe studies that assess the impact of HR approaches, including those addressing risk compensation. • Describe the overlap of HR with other approaches to care including Motivational Interviewing and Patient-Centered Care. • Discuss gap in the extant literature related to HR.
Week 2 -September 5: How did we get here?		
	(Broyles et al., 2014; Kelly, Wakeman, & Saitz, 2015)	<ul style="list-style-type: none"> • Discuss cultural, social, and legal factors that inform models of care. • Describe models of care that challenge HR approaches. • Explore their own determinants of mental models.
Week 3 - September 12: Individual HR Approaches: Behavioral and Medical (Motivational Interviewing & Shared Decision-Making)		
Assignment 1 Due: Reflective Paper	(Beach, Keruly, & Moore, 2006; Karoll, 2010)	<ul style="list-style-type: none"> • Describe models of care that overlap with HR principles. • Discuss components of MI. • Identify opportunities to continue learning on these topics.
Week 4 - September 19: Organizational HR Approaches		
	(Drucker, 1998; Wray & Deery, 2008)	<ul style="list-style-type: none"> • Discuss ways that HR strategies have been incorporated in provider settings. • Apply strategies for conducting environmental scans to assess organizational fit with HR concepts. • Conduct a policy review to determine aspects of care that may conflict with HR approaches.
Week 5 - September 25: Community-Based and Policy Approaches		
Assignment 2 Due: Policy Review	(Lantz, Lichtenstein, & Pollack, 2007; Miller, 2016)	<ul style="list-style-type: none"> • Explore national, local, and organizational policies that support or threaten HR-informed care. • Describe the implementation and effectiveness of public health initiatives that build on HR. • Discuss advocacy methods to influence social, political, and economic systems to effect change
Week 6 - October 3: Rolling with Ambivalence		
Guest Lecturers: The Open Door, Inc. <i>Harm Reduction at Home</i>	(Doe-Simkins et al., 2014; Hedlund, 2000; Miller, 2016)	<ul style="list-style-type: none"> • Discuss factors that contribute to resistance of HR. • Identify strategies for building alliances. • Develop next steps in advancing HR learning and practice. • Discuss strategies for preventing and addressing provider burnout.
Week 7 - October 10: Class Presentations		
Policy Review & Presentations Due		<ul style="list-style-type: none"> • Present an organized, engaging, and informative summary of final project. • Evaluate peer presentations.

Assignment #1: Reflection Paper

- 5-8 pages
- 100 points

The purpose of this assignment is to explore factors that contribute to our beliefs about healthcare, public health, and health outcomes. Choose a health issue (for example, obesity, heart disease, intimate partner violence, mental health disorders, etc.) For one week, keep a log where you briefly note each time you become aware of or think of the issue, the context in which it occurred, and your response to what you saw or experienced. These occurrences may include news articles, movies, journal articles, conversations with others, etc. Then, respond to the following:

- A. Describe the health issue. Provide statistics demonstrating the extent of the public health problem you are addressing, including specifics regarding populations that are most affected. Building from a socio-ecological perspective, describe underlying factors that contribute to the production of the disease or issue.
- B. Reflect on your one-week log.
 - a. What are some of the ways the issue was brought to your attention (news article or story, public health message, seeing someone who you think may experience the issue, or something else)?
 - b. In these instances, what information was presented to you?
 - c. In your opinion, was the information presented in an objective or biased manner? Why do you think so?
 - d. What were your subjective and objective responses to these experiences?
 - e. Describe the first time (or an early time) you recall learning of this public health issue. What was that context and what struck you about the issue at that time? How similar or different is what you know about the issue now compared to what you knew then?
- C. Finally, conduct a brief literature review to explore evidence-based interventions that have been developed to address the public health issue. Given your description of factors contributing to this public health issue, what gaps in interventions exist? Are the interventions and approaches that you have identified responsive to the underlying conditions that contribute to the production of disease or issue?

Assignment 1 Rubric				
Reflection Paper (100 pts.)				
A. Description of Health Issue	30	20	10	0
	<ul style="list-style-type: none"> ◦ Health/public health issue is described succinctly but with depth. ◦ Statistics regarding the breadth and depth of the issue are provided. ◦ If data are not available, proxy numbers are provided along with a discussion of barriers to and plans for data collection are included. ◦ Underlying factors that contribute to the production of the disease or issue. 	<ul style="list-style-type: none"> ◦ Section is not well-written (-2). ◦ Statistics regarding the breadth and depth of the public health issue are missing (-2). ◦ Data are not available but proxy numbers are not provided along with a discussion of barriers to and plans for data collection are included (-2). ◦ Underlying factors not described (-4). 	<ul style="list-style-type: none"> ◦ Section is poorly written, missing multiple elements, and overall is not well thought out. 	<ul style="list-style-type: none"> ◦ Section not addressed.
B. Reflection	30	20	10	0
	<ul style="list-style-type: none"> ◦ Multiple examples of the ways the issue was brought to the students' attention are described. ◦ Examples are noted along with a description of information that was presented. ◦ A thoughtful discussion of the subjectivity vs. objectivity of the accompanying information is presented. ◦ Response(s) to the scenarios described above is/are shared. ◦ A detailed description of early awareness of the public health issue is presented. 	<ul style="list-style-type: none"> ◦ Only one or two examples are described (-2). ◦ Description of the information that accompanied the examples is limited or missing (-2). ◦ A discussion of the subjectivity vs. objectivity of the information is limited or missing (-2). ◦ Responses to the scenarios are limited or missing (-2). ◦ A detailed description of early awareness of the issue is limited or missing (-2). 	<ul style="list-style-type: none"> ◦ Section is poorly written, missing multiple elements, and overall is not well thought out. 	<ul style="list-style-type: none"> ◦ Section not addressed.
C. Lit Review	30	20	10	0
	<ul style="list-style-type: none"> ◦ Section includes a discussion of what interventions have been used previously or are currently in use, and the degree to which they have been successful. ◦ Gaps in research and in available interventions are identified. ◦ This section provides a thoughtful discussion of the degree to which existing interventions are responsive to the underlying issues identified in section A. 	<ul style="list-style-type: none"> ◦ Discussion that describes methods of addressing the public health problem is missing or not specific (-10). ◦ Gaps in research or in available interventions are not described (-10). ◦ A discussion of the degree to which identified interventions are responsive to underlying issues is missing or poorly described (-10). 	<ul style="list-style-type: none"> ◦ Section is poorly written, missing multiple elements, and overall is not well thought out. 	<ul style="list-style-type: none"> ◦ Section not addressed.
D. Formatting	10	5	3	0
	<ul style="list-style-type: none"> ◦ Major subheadings used. ◦ Document is uploaded as described on course syllabus including naming conventions. ◦ Writing contains few or no spelling or grammatical errors. ◦ Document has proper citations throughout. 	<ul style="list-style-type: none"> ◦ Writing contains five or more spelling or grammatical errors (-3). ◦ Document is missing some citations (-2). 	<ul style="list-style-type: none"> ◦ Major subheadings not used, OR; ◦ Document is not uploaded/saved as instructed, OR; ◦ Writing contains frequent spelling and grammatical errors, OR; ◦ Citations infrequently or incorrectly used. 	<ul style="list-style-type: none"> ◦ Major subheadings not used AND document is not uploaded/saved as instructed. ◦ Citations ignored.
Total	100	65	33	0

Assignment #2: Journal Article Review

- 100 points

Each week in weeks two through six, a small group of students will present an overview of one of the readings assigned for that week using the Journal Article Review Worksheet below. (We will choose weeks and articles during the first class.)

This assignment includes two parts (1) completion of the worksheet and (2) leading a 30 minute discussion in class. You may divide up the work however you want but a suggestion is to have one person responsible for gathering input from group members to complete the worksheet and check for accuracy, and then assign primary responsibility to other team members in addressing each of the sections on the worksheet. The worksheet must be uploaded to CourseWeb before the start of the class when your group is presenting. This brief article may help you assess the credibility of the article <https://blog.efpsa.org/2011/08/01/how-to-critically-evaluate-the-quality-of-a-research-article.>)

You will be graded on accuracy of information presented and the degree to which you were able to facilitate your peers' discussion in class. In addition, each of you will be asked to anonymously report on the degree to which group members participated in the project.

Scoring

- Worksheet is fully completed prior to class: 40 points
 - For this section, each group member will receive the same number of points.
- Information presented during the in-class discussion is accurate and thorough: 40 points.
 - For this section, each group member is scored individually in accordance with their responsibility as indicated on the worksheet.
- Group members report that the student fully participated in this assignment: 20 points.
 - For this section, each group member is scored individually.

Journal Article Review Worksheet

Please provide the following information about the paper. Provide **page numbers** that show where you found information in the paper that relates to the questions below.

Group Member	Responsibility/Role on Project
1.	
2.	
3.	
4.	
5.	
A. What is the purpose, aim, or hypothesis of the paper? What gaps in research did the authors want to fill? You may use a direct quote from the paper or paraphrase in your own words.	
B. What methods did the authors use to test their hypothesis? How did they collect data and analyze their results? Did they report any limitations or problems with these methods?	
C. What were major findings or conclusions reported in the paper?	
D. How credible did you find the article? Were there any flaws in the design, methods, or logic? Overall do you find this article makes an important contribution to the field? Why?	

Assignment #3: Policy Review

- 5-8 pages
- 100 points

Select a *written* policy that relates to health or public health for your review. This can be an institutional or private policy (such as patient rights and responsibilities at a local provider) or a public policy enacted at the local, state, or federal policy, (such as Temporary Aid to Needy Families, 1994 California Proposition 187, and David's Law: Pennsylvania ACT 139).

- Provide a brief background on the policy:
 - When and where was it enacted?
 - Who and what were the driving forces for the policy?
 - What does it aim to accomplish?
- Discuss the impact or expected impact of the policy, both in terms of how it has (or will have) improved health outcomes as well as problems with or gaps in the policy.
 - Use data from credible sources including those found online as well as interviews with key stakeholders.
 - If using stakeholder input, provide information about the person you interviewed, why they are in an appropriate position to discuss the policy, and what makes them credible.
- Provide your opinion regarding the value of the policy.
 - Given what you learned about the policy impact, do you feel it is useful and effective?
 - How well does the policy align with principles of harm reduction (see Hawk, et. al., 2017)?
 - What recommendations do you have regarding the policy?

Here are some resources to get you started:

[Encyclopedia of Social Work](#)

[Comprehensive Handbook of Social Work and Social Welfare](#)

[Oxford Bibliographies: Social Work](#)

[Congressional Publications](#)

[CRS Research Reports](#)

[Nexis Uni \(Formerly LexisNexis AcademicSearch\)](#)

[MetaLib](#)

[USA.gov](#)

[Public Policy Institute of CA \(PPIC\)](#)

[Brookings Institute](#)

[RAND Corporation](#)

[Urban Institute: Social and Economic Policy Research](#)

[Pew Research Center](#)

[Annenberg Public Policy Center](#)

[The Commonwealth Fund](#)

[Population Reference Bureau](#)

[Center on Budget & Policy Priorities](#)

[Southern Poverty Law Center](#)

[Kaiser Family Foundation](#)

[Mathematica Policy Research](#)

[Prison Policy Initiative](#)

Assignment 2 Rubric				
Policy Review (100 pts.)				
A. Background	30	20	10	0
	<ul style="list-style-type: none"> ◦ The policy is fully described, including when/where it was enacted, what the driving forces were, and what it aims to accomplish. 	<ul style="list-style-type: none"> ◦ Detail is missing regarding when/where the policy was enacted (-3). ◦ Information regarding driving forces is missing or poorly described (-4). ◦ The aim of the policy is missing or poorly described (-3). 	<ul style="list-style-type: none"> ◦ Section is poorly written, missing multiple elements, and overall is not well thought out. 	<ul style="list-style-type: none"> ◦ Section not addressed.
B. Impact	30	20	10	0
	<ul style="list-style-type: none"> ◦ A thorough, data-driven discussion regarding the policy impact is provided. 	<ul style="list-style-type: none"> ◦ The discussion is based only on opinion rather than driven by data or stakeholder input (-5). ◦ The discussion is written in a manner that is unbiased and considers multiple perspectives (-5). 	<ul style="list-style-type: none"> ◦ Section is poorly written, missing multiple elements, and overall is not well thought out. 	<ul style="list-style-type: none"> ◦ Section not addressed.
D. Lit Review	30	20	10	0
	<ul style="list-style-type: none"> ◦ A comprehensive and thoughtful opinion regarding the value of the policy is provided. ◦ An analysis of the policy in keeping with the harm reduction principles is included. ◦ Recommendations regarding the policy are thoughtful. 	<ul style="list-style-type: none"> ◦ An opinion regarding the value of the policy is missing or poorly described (-3). ◦ An analysis of the policy in keeping with the harm reduction principles is missing or not fully developed (-4). ◦ Recommendations regarding the policy are missing or superficial (-3). 	<ul style="list-style-type: none"> ◦ Section is poorly written, missing multiple elements, and overall is not well thought out. 	<ul style="list-style-type: none"> ◦ Section not addressed.
E. Formatting	10	5	3	0
	<ul style="list-style-type: none"> ◦ Major subheadings used. ◦ Document is uploaded as described on course syllabus including naming conventions. ◦ Writing contains few or no spelling or grammatical errors. ◦ Document has proper citations throughout. 	<ul style="list-style-type: none"> ◦ Writing contains five or more spelling or grammatical errors (-3). ◦ Document is missing some citations (-2). 	<ul style="list-style-type: none"> ◦ Major subheadings not used, OR; ◦ Document is not uploaded/saved as instructed, OR; ◦ Writing contains frequent spelling and grammatical errors, OR; ◦ Citations infrequently or incorrectly used. 	<ul style="list-style-type: none"> ◦ Major subheadings not used AND document is not uploaded/saved as instructed. ◦ Citations ignored.
Total	100	65	33	0

Final Presentation

- 100 points (based on peer review)

Develop a brief presentation using PowerPoint or Prezi, summarizing the key elements of your policy review. This presentation is an opportunity to “boil down” your key points and findings. You will have 10 minutes to present including questions. The goal is to expose students to concepts explored in-depth by their peers.

The following rubric will be used by your peers to score your presentation, so plan accordingly.

Indicate the degree to which the presenter....	To a very high degree	To a moderate degree	Neutral	To a low degree	To a very low degree
1. Presented a comprehensive explanation of the policy background, including when/were it was enacted, what its driving forces were, and its purpose.	5	4	3	2	1
2. Provided a detailed discussion of policy impact or expected impact, which was driven by data and/or stakeholder input.	5	4	3	2	1
3. Thoughtfully described the value of the policy, in keeping with the harm reduction principles.	5	4	3	2	1
4. Nailed it! (Subjective score.)	5	4	3	2	1
Total Score					

Readings

- Ashton, J. R., & Seymour, H. (2010). Public Health and the origins of the Mersey Model of Harm Reduction. *International Journal of Drug Policy, 21*(2), 94-96.
- Beach, M. C., Keruly, J., & Moore, R. D. (2006). Is the quality of the patient-provider relationship associated with better adherence and health outcomes for patients with HIV? *J Gen Intern Med, 21*(6), 661-665. doi:10.1111/j.1525-1497.2006.00399.x
- Broyles, L. M., Binswanger, I. A., Jenkins, J. A., Finnell, D. S., Faseru, B., Cavaola, A., . . . Gordon, A. J. (2014). Confronting inadvertent stigma and pejorative language in addiction scholarship: a recognition and response. In: Taylor & Francis.
- Doe-Simkins, M., Quinn, E., Xuan, Z., Sorensen-Alawad, A., Hackman, H., Ozonoff, A., & Walley, A. Y. (2014). Overdose rescues by trained and untrained participants and change in opioid use among substance-using participants in overdose education and naloxone distribution programs: a retrospective cohort study. *BMC Public Health, 14*, 297. doi:10.1186/1471-2458-14-297
- Drucker, E., Wodia, A. et. al. (1998). Measuring harm reduction: the effects of needle and syringe exchange programs and methodone maintenance on the ecology of HIV. *AIDS, 12*(Suppl A), S217-S230.
- Hawk, M., Coulter, R., Egan, J., Friedman, M., Tula, M., & Kinsky, S. (2017). Harm Reduction Principles for Healthcare Settings. *Harm Reduction Journal, 14*(70).
- Hedlund, J. (2000). Risky business: safety regulations, risk compensation, and individual behavior. *Injury prevention, 6*(2), 82-89.
- Karoll, B. R. (2010). Applying social work approaches, harm reduction, and practice wisdom to better serve those with alcohol and drug use disorders. *Journal of social work, 10*(3), 263-281.
- Kelly, J. F., Wakeman, S. E., & Saitz, R. (2015). Stop talking 'dirty': clinicians, language, and quality of care for the leading cause of preventable death in the United States. *The American journal of medicine, 128*(1), 8-9.
- Lantz, P. M., Lichtenstein, R. L., & Pollack, H. A. (2007). Health policy approaches to population health: the limits of medicalization. *Health Affairs, 26*(5), 1253-1257.
- Miller, K. (2016, April 21, 2016). LePage vetoes bill aimed at increasing access to overdose antidote. *Portland Press Herald*. Retrieved from <https://www.pressherald.com/2016/04/20/lepage-vetoes-bill-aimed-at-increasing-access-to-heroin-anti-overdose-drug/>
- Wray, S., & Deery, R. (2008). The medicalization of body size and women's healthcare. *Health Care for Women International, 29*(3), 227-243.

Supplemental Readings

- Bigler, M. O. (2005). Harm reduction as a practice and prevention model for social work. *Journal of Baccalaureate Social Work, 10*(2), 69-86.
- Denning, P. (2010). Harm reduction therapy with families and friends of people with drug problems. *Journal of clinical psychology, 66*(2), 164-174.
- Doleac, J. L., & Mukherjee, A. (2018). The moral hazard of lifesaving innovations: naloxone access, opioid abuse, and crime. [Note: Please read this paper with a critical eye; it has received a great deal of pushback from the harm reduction and research communities. Inclusion of this article on the supplemental readings list should not be perceived as endorsement.]

Hari, J. (2015). *Chasing the scream: The first and last days of the war on drugs*: Bloomsbury Publishing USA.

Marlatt, G. A. (1996). Harm reduction: Come as you are. *Addictive behaviors*, 21(6), 779-788.

Blume, A. W., & Lovato, L. V. (2010). Empowering the disempowered: Harm reduction with racial/ethnic minority clients. *Journal of clinical psychology*, 66(2), 189-200.

DRAFT



University of Pittsburgh

School of Medicine
Department of Medicine
Division of General Internal Medicine at Oakland

UPMC Montefiore
Suite W933
200 Lothrop Street
Pittsburgh, Pennsylvania 15213-2582
412-692-4889
Fax: 412-692-4825

March 28, 2019

Patricia Documet, MD, DrPH
EPCC Chair

Dear Dr. Documet,

I am submitting this memo as notice for a minor revision to a School of Medicine, Institute for Clinical Research Education course (Social Networks and Health) to be offered in the Fall of 2019. The requested change is to cross list the course with the School of Public Health, Department of Behavioral and Community Health Sciences.

The syllabus for the Social Networks and Health course is strongly tied to many aspects public health. I plan to focus on concepts in population health, systems sciences, and health interventions, which I believe would be particularly relevant for public health graduate students. Further, I hope the course can be integrated with other related modular courses, such as Systems Theories and Approaches and Social Dynamics, to provide graduate students interested in health science a wide breadth of understanding in system sciences.

Thank you for your time, and I look forward to any thoughts you might have.

Sincerely,

Kar-Hai Chu, PhD
Assistant Professor of Medicine, Pediatrics, and Public Health
Center for Research on Media, Technology, and Health
University of Pittsburgh
(412) 692-2578

CLRES XXXX

Social Networks and Health

Course Information	Instructor Information
Dates:	Course Director: Kar-Hai Chu, PhD chuk@pitt.edu
Meeting days, time:	
Location:	

Overview and Objectives:

This course is an introduction to the theory, methods, and procedures of network analysis with emphasis on applications to health and social behavior. The goal of the course is to provide a working knowledge of concepts and methods used to describe and analyze social networks so that professionals and researchers can understand the results and implications of this body of research. The course also provides the training necessary for scholars to conduct network analysis in their own research and practice careers.

The course consists of readings, class discussions, analysis assignments, and a final project. Assignments are designed to build components of a full network study, culminating in the final project. Individual projects will use data that the student collects him/herself. The data collection and entry process will be quite simple and consist of identifying a group (a class, a club, organization, etc.) that students can ask to complete a simple questionnaire. Other electronic or observational sources of data may also be used.

Learning Objectives:

1. Read and comprehend concepts presented in the social network literature including its terminology and application.
2. Explain how network analysis contributes to areas of study of interest to the student.
3. Use network analysis as a research technique in their own research including knowledge of what concepts are applicable and how to collect and analyze social network data.
4. Conduct network analyses of original or secondary social network data that contributes to the scholarly or professional development of the field.

Recommended Textbook:

1. Scott, J. (2012). Social network analysis: A handbook (2nd Ed.). Newbury Park, CA: Sage.

Responsibilities

Please complete reading assignments before class and come prepared to discuss them. You will be assessed on your understanding of the assigned reading. Homework assignments are individual and to be turned in at the beginning of class on the due date. Late assignments will be penalized 10% per day past the due date (unless prior arrangements have been made).

Note: You will find all the assigned materials and activities on CourseWeb and should complete them by the dates and times indicated.

Course Requirements:

Class participation and attendance	20%
Homework assignments	30%
Final project	50%

Attendance Policy

Students are expected to sign-in to each class (computer provided in suite lobby). If a problem is encountered with the sign-in system, please contact the course instructor(s) as well as Allie Giel (alg190@pitt.edu) immediately.

Course Grading Scale:

For the computation of the final course grade as well as for the course assignments, the following grading scale will be used:

93 - 100 = A	86 – 89 = B+	76 – 79 = C	66 – 69 = D+
90-92 = A-	80 – 85 = B	70 – 75 = C+	60 – 65 = D+ < 60 = F

Website resources

All homework assignments, course information, and communication will be available at <http://courseweb.pitt.edu>.

Academic Integrity

Students in this course will be expected to comply with the [University of Pittsburgh's Policy on Academic Integrity](http://www.provost.pitt.edu/info/ai1.html) (<http://www.provost.pitt.edu/info/ai1.html>). Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an exam, including dictionaries and programmable calculators.

Competencies

The following competencies are addressed in this course:

- Research questions
- Reviewing other studies
- Study design
- Organizing datasets
- Data analysis plans

Course Schedule

Session 1: Introduction to social networks and health

Date:

Instructor: Chu

Learning Objectives:

- Introduce the basic language of networks and providing an overview of the course.
- Describe the history of network research with discussions of
 - Contributions from different academic disciplines
 - Major contributors to network analysis
 - Where is network analysis today and in the future.

In-Class Activities:

- Open discussions on how network analysis can be applicable to areas of interest to students

Required Reading(s):

- Valente, T. W. & Pitts, S. R. (2017). An appraisal of social network theory and analysis as applied to public health. *Annual Review of Public Health*.
- Christakis, N. A. & Fowler, J. H. (2009). The Spread of Obesity in a Large Social Network over 32 Years. *New England Journal of Medicine*, 357, 370-379.

Recommended Reading:

- Scott: Chapters 1 & 2

Homework Assignment:

- Network representations and network conversions

Session 2: Centrality measures, positions, and roles

Date:

Instructor: Chu

Learning Objectives:

- Learn the basics of centrality, one of the most useful concepts in network analysis
- Discuss various centrality measures and the differences in their computation and application
- Understand distance calculations which are often used to calculate centrality measures
- Discuss the application of centrality measures to behavior change programs

In-Class Activities:

- Software demonstration of centrality measures, positions, and roles

Required Readings:

- Freeman, L. (1979). Centrality in social networks: conceptual clarification. Social Networks. 1, 215-329

Recommended Reading:

- Scott: Chapter 5, pages 85-99

Homework Assignment:

- Centrality calculations

Session 3: Ego-centric networks

Date:

Instructor: Chu

Learning Objectives:

- Learn how to measure ego-centric networks
- Understand some common instruments used and common measures created from ego-centric data
- Discuss the major hypotheses investigated using ego-centric data

Required Readings:

- Marsden, P. V. (1987). Core discussion networks of Americans. *American Sociological Review*, 52, 122-131.
- Campbell, K. E. and Lee, B. A. (1991). Name generators in surveys of personal networks. *Social Networks*, 13, 203-221.

Homework Assignment:

- Design data collection for ego-centric data

Session 4: Structure and positions

Date:

Instructor: Chu

Learning Objectives:

- Learn how to identify positions, or roles, in a network
- Understand how to group together nodes that have the same links to other nodes
- Discuss how nodes can occupy the same position without necessarily being directly connected to one another (in contrast to groups).

In-Class Activities:

- Live demonstration of 6-degrees of separation

Required Reading(s):

- Burt, R. (1987). Social contagion and innovation: Cohesion versus structural equivalence. American Journal of Sociology, 92, 1287-1335.

Recommended Reading:

- Scott: Chapter 7, pages 126-148

Homework Assignment(s):

- Design data collection for network data

Session 5: Online data

Date:

Instructor: Chu

Learning Objectives:

- Describe online network data and how offline measures can or cannot be mapped
- Understand the nuances of big data
- Discuss the necessity and utility of software packages
- Example studies of network online data

Required Reading(s):

- Lewis, K., Kaufman, J., Gonzalez, M., Wimmer, A., & Christakis, N. (2008). Tastes, ties, and time: A new social network dataset using Facebook. *com. Social networks*, 30(4), 330-342.
- Kramer, Adam DI, Jamie E. Guillory, and Jeffrey T. Hancock. "Experimental evidence of massive-scale emotional contagion through social networks." *Proceedings of the National Academy of Sciences* (2014): 201320040.
- Chu, Kar-Hai, Jennifer B. Unger, Jon-Patrick Allem, Monica Pattarroyo, Daniel Soto, Tess Boley Cruz, Haodong Yang, Ling Jiang, and Christopher C. Yang. "Diffusion of messages from an electronic cigarette brand to potential users through Twitter." *PloS one* 10, no. 12 (2015): e0145387.

In-Class Activities:

- Live demonstration of online network data analysis

Homework Assignment(s):

- Incorporate feedback from instructor on network study

Session 6: Interventions

Date:

Instructor: Chu

Learning Objectives:

- Discuss importance of understanding system and organizational functioning and how networks can be used to improve it
- Discuss several studies that have tested network interventions and many intervention choices exist
- Learn that who delivers the message, and how, may be more important than its content

Required Reading(s):

- Valente (2012) Network Interventions. Science
- Valente, T. W., Palinkas, L. A., Czaja, S., Chu, K. H., & Brown, C. H. (2015). Social Network Analysis for Program Implementation. PLoS One, 10(6), e0131712. doi:10.1371/journal.pone.0131712.
- Valente, T. W., Hoffman, B. R., Ritt-Olson, A., Lichtman, K., & Johnson, C. A. (2003). The effects of a social network method for group assignment strategies on peer led tobacco prevention programs in schools. American Journal of Public Health, 93, 1837-1843.

Homework Assignment:

- Update ego- or network-centric design to integrate intervention

Session 7: Models, begin presentations

Date:

Instructor: Chu

Learning Objectives:

- Introduce new developments in the implementation of statistical procedures for testing network properties
- Discuss ERGM, which enable researchers to test hypotheses about network structure and the distribution of behaviors that explicitly accounts for the non-independence and structural dependence of social networks
- Understand how programs are in their infancy, and application just growing.
- Introduce longitudinal data, and the use of the stochastic actor oriented behavioral (aka SIENA) model to test for social influence and selection.

Required Reading(s):

- Robins et al (2007) An introduction to exponential random graph (p^*) models for social networks. Social Networks
- Harrigan, N. (2009). Exponential random graph (ERG) models and their application to the study of corporate elites. Oxford UK: Center for research methods in the social sciences, Department of Politics and International Relations, University of Oxford
- Snijders, T. A. B., van de Bunt, G. G., & Steglich, C. E. G. (2010). Introduction to stochastic actor-based models for network dynamics. Social Networks, 32, 44-60.

In-Class Activities:

- First 5 presentations (50 minutes)

Session 8: Presentations

Date:

Instructor: Chu

In-Class Activities:

- Final 10 presentations (100 minutes)

Course Wrap-up:

- Resources for further leadership development (locally and nationally)
- List of additional readings/resources
- Feedback and Course Evaluation



University of Pittsburgh

Graduate School of Public Health
Office of Student Affairs

G009 Public Health
130 DeSoto Street
Pittsburgh, PA 15261
412-624-3002
Fax: 412-624-3755
publichealth.pitt.edu

April 4, 2019

Kar-Hai Chu, PhD
Assistant Professor, Medicine

Dear Dr. Chu,

Thank you for submitting a request to the Educational Policies and Curriculum Committee (EPCC) to cross list your class CLRES XXXX: *Social Networks and Health*. The Committee Chair has recommended formal approval for this cross listing.

Please work with the appropriate staff at the School of Medicine, Institute for Clinical Research Education as well as the student services staff in the Behavioral and Community Health Sciences department to ensure that the Office of the University Registrar receives the necessary paperwork to add this update to the catalog.

We believe your class will be an important component of the Pitt Public Health curriculum and wish you success in delivering it.

Should you have any additional questions or concerns, please let me know.

Best Regards,

A handwritten signature in black ink that reads "Patricia Documet".

Patricia Documet, MD, DrPH, Chair
Educational Policies and Curriculum Committee

cc: Steven Albert, PhD
Chair, Department of Behavioral and Community Health Sciences

Jessica Burke, PhD
Associate Dean for Education

Cindy Bryce, PhD, Associate Dean for Student Affairs
Office of Student Affairs

Paul Markgraf, MS, Academic Administrator
Department of Behavioral and Community Health Sciences

Mary Derkach, JD, MSIS, Assistant Dean for Student Affairs
Office of Student Affairs

Joanne Pegher, Graduate Course Coordinator
Office of Student Affairs

**Graduate School of Public Health
Educational Policies and Curriculum Committee
Meeting Minutes | March 7, 2019**

Present: Jessica Burke, Mary Derkach, Ying Ding, Patricia Documet, Julia Driessen (phone), Jim Fabisiak, David Finegold, Nancy Glynn, Summer-Rae Haston, Robin Leaf, Kimberly Rehak, John Shaffer.

The meeting was called to order at 1:30pm by Dr. Patricia Documet, chair.

Modified course: EPIDEM 2602: *Application of Molecular Biomarkers in Epidemiology* | Jennifer Adibi (EPIDEM)

Dr. Jennifer Adibi presented an application for a modified course that that the committee approved February 2, 2017 as EPIDEM 2610: *Molecular epidemiology – tools and techniques*. Changes include a course number & name change as well as an increase in credits from 1 to 2 meant to provide students with more lab time to work on their project(s).

Dr. Adibi questioned about grading scale and whether the course should be pass/fail or have a letter grade. The committee members explained that a good grade in the course could boost students' GPA, but that if the course did become graded, assignments, rubrics, etc. would need to be added to the syllabus. Dr. Nancy Glynn questioned whether students could choose to take the course for a letter grade or pass/fail, which is possible. No decision was made about the letter grade at this meeting.

Dr. Josh Mattila raised the issue of having required research modules added to the syllabus, such as chemical hygiene, blood-borne pathogens, etc. Dr. Adibi would look into this issue, as well.

In terms of offering this class to students in other departments, Dr. John Shaffer said that Human Genetics students would probably consider taking this course and that it had potential as a possible elective for the Public Health Genetics certificate, an issue for future consideration.

ACTION: The committee recommended conditional approval of this course, provided that Dr. Abidi provide an explanation of how attendance and participation will be calculated and remove the text "and learn how to" from Learning Objective #2. Additionally, the committee voted to have Dr. Adibi return to the April 11, 2019 EPCC meeting to provide an explanation behind the decision of

New course: IDM XXXX: *Infection Prevention and Control for Healthcare Settings* [2 credits], Linda Frank (IDM) and Mohamed Yassin, MD (Medicine)

New course: IDM XXXX: *Infection Prevention and Control Practicum/ Preceptorship* [3 credits], Linda Frank (IDM) and Mohamed Yassin, MD (Medicine)

Drs. Linda Frank and Mohamed Yassin presented two proposals for new courses for students who are interested in infection prevention. The 2-credit *Infection Prevention and Control for Healthcare Settings* course is meant to be a didactic course that will provide an introduction to the field of infection prevention and *Infection Prevention and Control Practicum/ Preceptorship* is a practical 3-credit course.

The committee questioned if practica would be limited to hospital settings, and the presenters said that it would be a good to provide opportunities to do research in resource poor settings like nursing homes. Committee members were excited about the potential that this sequence of courses could be the groundwork for an infection prevention certificate program. objectives need to apply to the course but current LOs can be integrated into the syllabus

ACTION: The committee voted to approve these two courses provided that the following changes were made: resubmitting the proposal so that there is one application for each course, changing the course time to 1 hour and 50 minutes per meeting time for 15 weeks on the syllabus for the didactic course, listing the teaching percentages in question 5a of the applications, completing question 11b on the applications describing how this course will address public health issues involving diversity, and determining if the practicum experience will satisfy CEPH practicum competency requirements.

Preliminary discussion of new BIOST MS areas of concentration: *Health Data Science and Computational Genomics*, Ada Youk, (BIOST) | Ada Youk and Jenna Carlson (computational)

Drs. Ada Youk and Jenna Carlson informed the committee of two Areas of Concentration that the Department of Biostatistics is adding to their curriculum. These changes are a response to changes in the field of Biostatistics and intend to provide students with more specialized plans of study. Students in the Biostatistics' Master of Science program will now have three options: 1) the traditional MS degree (no track), 2) a Health Data Science track, and 3) a Computational Genomics track.

Their plan is to have all students take the same course in their first year of study and start taking elections for their second semester. They will provide more information about the course sequencing plan and their process for switching into or out of the areas of concentrations in their forthcoming official proposal.

They decided to add Areas of Concentration instead of new Master's degree programs as the approval process is faster.

ACTION: No action necessary.

Revised program: BCHS MPH, Martha Terry (BCHS)

Dr. Martha Terry presented an application for a revised program that contained the changes made to the Behavioral and Community Health Science's Master of Public Health curriculum in response to both the changes in the CEPH competencies and student feedback asking for more latitude in course choice. Major changes include a change in theory requirement. What was once a 3-credit course is now a "theory series" of 3 5-week long 1-credit course modules, including: BCHS 2520: Theories of Health Education and Health Promotion, BCHS 2992: Systems Theories and Approaches, and BCHS 2990: Social Dynamics. The changes made to the curriculum in the number of required credits allows students to select more elective courses.

ACTION: The committee discussed and reviewed the proposal and recognized that the changes to the program were minor and did not require official approval.

Vote on two new courses: HPM XXXX: *HPM Professional Development Seminar*, presented by Kevin Broom in February

The committee voted on two new courses that Dr. Kevin Broom presented at the February 7, 2019 EPCC meeting. The original course applications were for 0 credit courses, however the Provost is no longer accepting new 0 credit courses. The HPM program director were reshuffling the credits so that these two courses could be 1-credit but the overall number of credits required for the programs remained the same.

The committee members discussed whether it was possible to have the same learning objectives for two different syllabi and decided that it was acceptable if an explanation was provided before the learning objectives that explained the distinction between the two courses.

ACTION: The committee voted to approve the courses provided that they make the following changes: resubmit the application documents so that there is one application, one syllabus, and one course name for each course, separate the schedule by term in the syllabi, change the number of credits from 0 to 1 in both the application and syllabus, and include a paragraph before the Learning Objectives specifying that the spring course will fulfill the Learning Objectives at a more advanced level.

Modified course: EPIDEM 2602: *Epidemiological Methods 2*, Ashley Naimi (EPIDEM)

Dr. Ashley Naimi presented an application for a modified course being updated and modernized. The course covers different topics, such as how to analyze data with causality in mind and machine learning. Students will learn how to apply these methods using R. Committee members addressed the answer to question 12b in the application and asked for an answer to be provided.

ACTION: The committee voted to approve the course provided that Dr. Naimi resubmit the EPCC application and provide an answer to question 12b and change Learning Objective #13 in the syllabus to a measurable statement using Bloom's Taxonomy, such as "Critically assess how to (and how not to) analyze data."

Approval of February Meeting Minutes, All

ACTION: The committee approved the February minutes provided that we the C from John Shaffer's last name and remove "was" form the verb phrase "was expressed" in the third paragraph of the HPM XXXX section of the minutes.

The meeting was adjourned at 3:33pm.