

2018 – 2019

**Department of Population &
Quantitative Health Sciences**

Program Handbook

MS in Biostatistics



SCHOOL OF MEDICINE
CASE WESTERN RESERVE
UNIVERSITY

Department of Population & Quantitative Health Sciences

School of Medicine, Wood Building, Room WG-57
Case Western Reserve University
10900 Euclid Avenue
Cleveland, Ohio 44106-4945
<http://epbiwww.case.edu>

Jonathan Haines, PhD

Chair, Mary W. Sheldon Professor of Genomic Sciences

Ena McDowell

Assistant to the Chair

Mendel Singer, PhD, MPH

Vice Chair for Education, Department of Population &
Quantitative Health Sciences
MS in Biostatistics Program Director
Email: mendel@case.edu
Phone: 216.368.1951

Nickalaus Koziura, EdM

Administrative Director of Non-Clinical
Graduate Education
Email: nickalaus.koziura@case.edu
Phone: 216.368.5957

School of Graduate Studies

Tomlinson Hall, Room 203
(216) 368-4390 (phone)
(800) 368-4723 (toll free)
(216) 368-2000 (fax)
gradstudies.case.edu

Charles Rozek, PhD, Vice Provost & Dean

Lynmarie Hamel, JD, Associate Dean of Graduate Studies

Brandon Bowman, Manager of Graduate Academic Affairs



Additional University Offices

Access Services (IDs & Parking)

Crawford Hall, Room 18
(216) 368-2273
www.case.edu/finadmin/security/access/access.htm

Career Center

Sears Building, Room 206
(216) 368-4446
studentaffairs.case.edu/careers

Financial Aid

Yost Hall, Room 417A
(216) 368-4530
finaid.case.edu

Free Computer Support & Service

11424 Bellflower Rd.
(216) 368-4357
help.case.edu

Registrar

Yost Hall, Room 110
(216) 368-4310
www.case.edu/registrar

Student Affairs

Adelbert Hall, Room 110
(216) 368-2020
studentaffairs.case.edu

University Health Service (Student Medical Center)

2145 Adelbert Rd.
(216) 368-2450
studentaffairs.case.edu/health

University Counseling Services

Sears Building, Room 201
(216) 368-5872
studentaffairs.case.edu/counseling

Police & Security Services

Emergency - 911

Urgent Matters; Safe Ride; Escort Service: (216) 368-3333

Safe Ride Program (7pm-3am)

Security Escort Service (24 Hours)

Security (Information) - (216) 368-4630

www.case.edu/finadmin/security/

University Circle Police

2100 Euclid Avenue
(216) 791-1234

Welcome from the Graduate Program Director

Welcome to the Masters of Science Program in Biostatistics in the Department of Population and Quantitative Health Sciences at Case Western Reserve University School of Medicine! This handbook is a general summary of academic program information and should be used in consultation with an academic advisor. Students should also review the Case Western Reserve [University's Student Handbook](#) which describes the University requirements for graduation. The Department of Population and Quantitative Health Sciences has additional expectations and requirements. Those expectations are detailed in this handbook. If a student is uncertain about a requirement or perceives a conflict, then the student should bring this to the attention of her/his academic advisor. Any variation in policy or expectations will be documented and notification will be sent to impacted students.

Congratulations on taking your first step and we are excited to have you in our program!

Sincerely,

Mendel Singer, PhD, MPH
MS in Biostatistics Program Director
Vice Chair for Education, Department of
Population and Quantitative Health
Sciences



Table of Contents

Mission, Values, and General Orientation - 6	Repeating a Course – 27
General Requirements – 11	Transfer of Credit – 27
Track Comparison Chart – 15	Internal Transfer of Credit – 28
Student Information System (SIS) – 16	Ethics in Conducting Research – 28
Planned Program of Study – 16	Academic Integrity – 29
Academic Advisor – 17	Changing a Course Grade – 29
Student Responsibility – 17	Grievance Procedure – 30
Support for Students – 18	Leaves of Absence – 30
Sample Planned Program of Studies – 19	Maintenance of Good Standing – 31
Professional Commitment and Culture – 23	Graduation – 31
Disciplinary Policy - 24	Waiver of Registration – 32
Communication Among Students, Faculty, and Staff – 25	Summary of Deadlines - 33
Waiving a Course – 26	

Mission, Values and General Orientation

The mission of this program is to train outstanding biostatistics professionals who will become important contributors to primarily health-related research. Our graduates are prepared to be extremely competitive in the job market, while also being prepared for doctoral studies, which many of our graduates choose to pursue.

Biostatisticians are professionals who are part of teams that determine the best ways to prevent and treat disease, and increase knowledge of human health and disease to pave the way for future discovery. Our faculty, students and graduates aren't just "numbers people". They are health research professionals who are passionate about using their natural talent and training to improve health and save lives. As a biostatistician, you will design and analyze studies to ensure the goals of the study can be met, effectively and consistently. You will work in collaboration with clinical and scientific experts, and learn a great deal about the subjects you study. Our graduates are ready to be full-fledged co-investigators.

Students will master the rigorous scientific and analytic methods necessary to be at the forefront of efforts to not only describe, but effectively evaluate and improve population health. Research and professional development seminars will help you keep abreast of current literature and identify important areas of research and collaborative opportunities, as well as guide you in choosing a career path and prepare for the job search. The department operates within a strong interdisciplinary framework involving faculty and staff in the department, the School of Medicine, and across the entire university, as well as leaders in health care institutions and health-oriented organizations and agencies throughout the wider community. More than 200 graduate students outside the Biostatistics program are pursuing the Master of Public Health, PhD in Epidemiology and Biostatistics, or the M.S. in Clinical Research –and there are certificate students as well. Our M.S. in Epidemiology and Biostatistics program was previously divided into separate programs for students pursuing Epidemiology and those pursuing Biostatistics. At present, we offer only the Biostatistics program. We will be starting a MS and PhD program in Biomedical and Health Informatics in January 2019. The rich atmosphere provided by this mix of students simulates the "team science" approach that dominates research today. The diversity in students mirrors the diversity in areas of faculty expertise. Students are encouraged to engage with students and faculty from other programs.

Graduates from accredited universities and colleges will be considered for admission to the department. All applicants must satisfy both CWRU and department requirements for graduate admission. All incoming MS students take a required

31-credit curriculum, which includes 18 credits of core and 9 track-specific credits, 1 Biostatistical Consulting credit (PQHS 602 Section 102), and 3 Internship/Practicum credits (PQHS 602, section of the track leader). Current track options for the MS in Biostatistics are: Biostatistics, Genomics and Bioinformatics, Health Care Analytics, and Social & Behavioral Science (see descriptions below). On completion of the internship/practicum requirements, students must submit a written report detailing the project and their role. This written report serves as a comprehensive exam for the MS program.

Biostatistics Track

The biostatistics-track students will receive a carefully designed balanced training in biostatistical theories, methods, and biomedical applications. This track student will gain mastery of basic probability theory and statistical inference, learn the methods of survival and longitudinal data analysis, and still have the flexibility to choose an elective from advanced courses. The didactic methods and theory, and hands on analytical training would lead to either the pursuit of an advanced relevant degree and/or work as a master's level biostatistician in various settings, e.g. academia, industry, hospitals, Pharmaceutical companies or government agencies.

Track-Required Courses:

Survival Data Analysis (PQHS 435)

Introduction to Mathematical Statistics (PQHS 480)

Longitudinal Data Analysis (PQHS 459)

One of the following courses:

Machine Learning and Data Mining (PQHS 471)

Multivariate Analysis and Data Mining. (STAT 426)

Track Leader:

Dr. Abdus Sattar, PhD

Email: sattar@case.edu

Phone Number: (216) 368-1501

Website: sattar.case.edu

Genomics and Bioinformatics Track

Students will be trained to work in genomics and bioinformatics areas. In addition to the basics in biostatistics, they will learn the designs, methods, techniques, and tools that are commonly used in genetic epidemiology, statistical genomics, and bioinformatics research. Big Data methods of data mining and machine learning are also required in this track. Target job positions are analyst, statistician and bioinformatics in a genomics or genetic epidemiology research team in a research institute/university, pharmaceutical or biotech company.

Track-Required Courses:

Introduction to Genomics and Human Health (PQHS 451)

Statistical Methods in Genetic Epidemiology (PQHS 452)

Design & Analysis of Sequencing Studies (PQHS 457)

Machine Learning & Data Mining (PQHS 471)

Track Leader:

Chun Li, PhD

Email: cxl791@case.edu

Phone Number: (216) 368-5633

Health Care Analytics

Biostatistics is a vital part of clinical research, which includes both observational studies and randomized clinical trials. Modern clinical, or patient, research takes advantage of innovative methodologies for the design and analysis of such studies to increase the likelihood of success and minimize patient burden and the use of scarce resources. Clinical research biostatisticians work as part of multi-disciplinary teams with clinical and statistical investigators to develop and execute study designs and analysis plans with scientific rigor, and in support of regulatory requirements by sanctioning bodies and funding agencies. Principal roles include the design, analysis, coordination and reporting of observational and trial-based clinical research studies. Most of a clinical research biostatistician's work is dedicated to evaluating, executing and reporting on well-designed studies to help investigators meet their scientific objectives. Related job titles include biostatistician, lead, senior or principal biostatistician, consulting statistician, statistical researcher, statistical programmer, clinical informaticist, data scientist and clinical research manager. Such positions require strong written and verbal communication skills, and the ability to work as part of a team with subject matter experts on protocol development and statistical reporting. Biostatisticians completing the Health Care Analytics track will be well-positioned to apply for positions in industry, academia (including teaching hospitals), pharmaceutical companies and government.

Track-Required Courses:

Large Health Care Databases and Electronic Health Records (PQHS 515)

Survival Data Analysis (PQHS 435)

Two of the following courses:

Longitudinal Data Analysis (PQHS 459)

Observational Studies (PQHS 500)

Clinical Trials (PQHS 450)

Machine Learning and Data Mining (PQHS 471)

Track Leader:

Thomas Love, PhD

Email: tel3@case.edu

Phone Number: 216.778.1265

Social & Behavioral Science

Students will be trained to work as analysts and research assistants in the social and behavioral sciences, including anthropology, sociology, psychology, psychiatry, and social work. Students will be trained in the most common study designs and analytic methods in these application areas. Such work often involves collaboration with multidisciplinary teams in community-practice / biomedical settings, with a focus on developmental, social/behavioral, cognitive, and/or mental health outcomes. This track is intended for students whose undergraduate work involved a major or minor in one of the social and behavioral sciences. It was created to serve the needs of social and behavioral science researchers who need research analysts trained in statistics, but with an understanding of their field and familiarity with qualitative and mixed methods as well. Target job positions are in academia, government, and research institutes.

Track-Required Courses:

Longitudinal Data Analysis (PQHS 459)

Structural Equation Modeling (NURS 632)

Qualitative and Mixed Methods (MPHP 482)

Measurement of Behavior (PSCL 412 or PQHS 412)

Track Leader:

Arin Connell, PhD

Email: arin.connel@case.edu

Phone Number: 216.368.1550

General Requirements

The degree of Masters of Science in Biostatistics is awarded in recognition of general knowledge of foundational areas of biostatistics and specialized study in an area of application (one of four tracks). Graduates will have demonstrated their ability to perform biostatistical analysis and to communicate the results in a formal written project report. Our goal is to produce biostatisticians who will be full-fledged and valued collaborators in health-related projects. Students will also be prepared for success in a doctoral program.

The Masters of Science in Biostatistics degree in the Department of Population and Quantitative Health Sciences comprises the following components:

- Core Curriculum (16 credit hours)

- Track-required course (12 credit hours)

- Internship/Practicum (3 credit hours)

- Written report from internship/practicum (Serves as final exam for MS degree)

Core Curriculum (16 credits)

The basic core curriculum is designed to provide MS students with the foundational material for all tracks within the Department. The Basic Core Curriculum is comprised of 18 credits in the following courses:

PQHS 414 Data Management and Statistical Programming (3 credits -Fall)

PQHS 431 Section 100 Statistical Methods in Biological and Medical Sciences I (3 credits -Fall)

PQHS 432 Statistical Methods in Biological and Medical Sciences II (3 credits - Spring)

PQHS 453 Categorical Data Analysis (3 credits - Summer)

PQHS 490 - Introduction to Epidemiology (3 credits - Fall)

PQHS 602 – Section 102 Introduction to Biostatistical Consulting (1 credit - Fall)

Track Required Courses (12 Credits)

The MS coursework requirement also consists of concentrated studies within one of the four tracks offered by our department: Biostatistics, Genomics and Bioinformatics, Health Care Analytics, Social and Behavioral Science.

Most MS students will specify a track when they apply to or after being accepted to the program. Students seeking to complete the program using the intensive 1-year format must declare a track prior to the beginning of their first semester of courses. Others must declare a track by the end of their first spring semester.

Biostatistics

PQHS 480 Introduction to Mathematical Statistics (3 Credits - Fall)

PQHS 459 Longitudinal Data Analysis (3 Credits - Spring)

PQHS 435 Survival Analysis (3 Credits - Spring)

One of the following courses:

PQHS 471 Machine Learning and Data Mining (3 Credits - Spring)

STAT 426 Multivariate Analysis and Data Mining (3 Credits - Spring)

PQHS 450 Clinical Trials (3 Credits - Spring)

Genomics and Bioinformatics

PQHS 451 Introduction to Genomics and Human Health (3 Credits - Fall)

PQHS 452 Statistical Methods in Genetic Epidemiology (3 Credits - Spring)

PQHS 457 Design & Analysis of Sequencing Studies (3 Credits - Spring)

PQHS 471 Machine Learning & Data Mining (3 Credits - Spring)

Health Care Analytics

PQHS 515 Large Health Care Databases and Electronic Health Records (3 Credits - Fall)

PQHS 435 Survival Analysis (3 Credits -Spring)

Two of the following courses:

PQHS 459 Longitudinal Data Analysis (3 Credits - Spring)

PQHS 500 Observational Studies (3 Credits - Spring)

PQHS 450 Clinical Trials (3 Credits - Spring)

PQHS 471 Machine Learning and Data Mining (3 Credits – Spring)

Social & Behavioral Science

PQHS 459 Longitudinal Data Analysis (3 Credits - Spring)

NURS 632 Structural Equation Modeling (3 Credits - Spring)

MPHP 482 Qualitative and Mixed Methods (3 Credits - Fall)

PSCL 412 or PQHS 412 Measurement of Behavior (3 Credits - Spring)

Internship/Practicum (3 Credits)

The internship/practicum is a crucial part of the student's training, where the student can experience the life cycle of an analysis and participate in the research process and see how a biostatistician collaborates. This experience helps prepare the student for future job interviews and jobs, and may lead directly to a job. All students must complete a 3 credit internship/practicum, registering for 3 credits of PQHS 602 in the section for their track leader. Each internship must be approved, using the form to be filled out by the student and signed by the preceptor and the student. The internship/practicum approval form is available from the Administrative Director for Non-Clinical Graduate Education. These may be completed at any time of year. It is perfectly fine for the time period to straddle more than 1 academic semester, in which case the student will typically register in the final semester in the internship/practicum period. We define an internship as being done on-site, while a practicum is done off-site under the supervision of a faculty member. The internship/practicum requires at least 160 hours of work (may be paid or unpaid) and be conducted under the supervision of a suitably trained preceptor, usually a biostatistician. We encourage off-campus internships (e.g. at

affiliated hospitals or NIH or a pharmaceutical company) when appropriate. During an internship or practicum the student will complete an analysis from start to finish and write a full report of the project, with their role clearly stated. A typical report should include a substantive write-up of the study's background, methods, results and discussion – much like a published paper or formal internal company study report. Students may not have been a participant in every aspect of the study, and should be clear in the write-up as to what they themselves did. Regardless of their role, the report should include relevant aspects of the background and methods sections so the study itself is adequately described. There should also be a one page abstract. Writing this report is an important part of the internship/practicum experience, and serves as the written exam for the MS degree. It is graded (A-F) by the track leader.

Track Comparison Chart

	Biostatistics	Health Care Analytics	Genomics & Bioinformatics	Social & Behavioral Science
Required Courses	PQHS 414 – Data Management and Statistical Programming (Fall) – 3 Credits			
	PQHS 431 (Section 100) – Statistical Methods in Biological and Medical Science I (Fall) – 3 Credits			
	PQHS 432 – Statistical Methods in Biological and Medical Science II (Spring) – 3 Credits			
	PQHS 453 Categorical Data Analysis (Summer) – 3 Credits			
	PQHS 490 – Epidemiology: Introduction to Theory and Methods (Fall) – 3 Credits			
	PQHS 602 (Section 102) – Introduction to Biostatistical Consulting (Fall) – 1 Credit			
	PQHS 602 – Internship/Practicum (Summer) – 3 Credits			
	Track Specific Courses	PQHS 435 – Survival Analysis (Spring) – 3 Credits		PQHS 471- Machine Learning & Data Mining (Spring) – 3 Credits
PQHS 480 – Intro to Statistical Theory (Fall) – 3 Credits		PQHS 515 – Secondary Analysis of Large Health Care Data Bases (Fall) – 3 Credits	PQHS 451 – A Data Driven Introduction to Genomics and Human Health (Fall) – 3 Credits	NURS 632 – Advanced Statistics: Structural Equation Modeling (Spring) – 3 Credits
PQHS 459 - Longitudinal Data Analysis (Spring) – 3 Credits		Select 2 of the Following	PQHS 452 – Statistical Methods for Genetic Epidemiology (Spring) – 3 Credits	MPHP 482 – Qualitative and Mixed Methods Research (Fall) – 3 Credits
Select 1 of the Following		PQHS 459 - Longitudinal Data Analysis (Spring) – 3 Credits	PQHS 457 – Design & Analysis of Sequencing Studies (Spring) – 3 Credits	Select 1 of the Following
PQHS 471- Machine Learning & Data Mining (Spring) – 3 Credits		PQHS 500 – Design & Analysis of Observational Studies (Spring) – 3 Credits		*PSCL 412- Measurement of Behavior (Spring) – 3 Credits
STAT 426 – Multivariate Analysis & Data Mining (Spring) – 3 Credits		PQHS 450 Clinical Trials (Spring) – 3 Credits		*PQHS 412 - Measurement of Behavior (Spring) – 3 Credits
PQHS 450 Clinical Trials (Spring) – 3 Credits		PQHS 471- Machine Learning & Data Mining (Spring) – 3 Credits		* Taught in alternating years

Student Information System (SIS)

The Student Information System (SIS) is a secure, flexible, web-based environment for creating and managing academic records at Case Western Reserve University.

The Student Center section of the SIS is the main launching point for accessing academic, financial and personal information. [SIS](#) can be accessed via the “quick link” section at the bottom of the CWRU homepage.

Students can access training guides, information, references, and FAQs through the [University Registrar](#).

This site is updated any time there are changes made regarding the SIS. The University registrar is also available to help with SIS-related issues. The number to the registrar’s office is 216.368.4310.

Planned Program of Study

In adherence with the School of Graduate Studies’ policy, during the first semester of study, all students are responsible for ensuring that they have a Planned Program of Study (PPOS) on file, submitted through the Student Information System (SIS). The PPOS consists of all courses a student plans to take to meet the requirements for his/her degree, listed by the semester in which they were/will be taken. This includes all required coursework and electives. The Planned Program of Study must be approved by the student’s academic advisor and should be submitted by October 15 of the first semester of study toward the degree specified, and updated, if necessary, by October 1 of each subsequent year in which the student is registered. When a student submits the PPOS in SIS, the advisor is contacted to approve. After the advisor approves the PPOS, the School of Graduate Studies is automatically notified by SIS to approve. Students are responsible for discussing their background and future academic and career goals with their academic advisor so that the best possible plan is developed.

Students enrolled in the MS program are expected to successfully complete all coursework, research, and other requirements for the Masters of Science degree. Students must get a “B” grade or better in all graded, core required courses, and a “C” or better in all other graded courses in order to count towards the degree.

Academic Advisor

Upon acceptance into the MS program, each student will be assigned an initial academic advisor (usually the Program Director) who will guide the student through department and graduate school regulations, assist him or her in designing their first semester course registration and an initial draft of their program of study. Students will often switch their academic advisor to their track leader or other program faculty, and this is encouraged. This can be done by first contacting the current advisor and then emailing the Administrative Director of Non-Clinical Graduate Education. The academic advisor will track the student's progress toward degree completion, help with selecting electives and provide career advice.

Every semester, each student will automatically get an advising hold placed on their account, preventing them from registering. This hold can be removed in the Student Information System (SIS) by their academic advisor or the program director, once they have been satisfied that the student has received proper advising about what courses to take.

Student Responsibility

Students should consult with their academic advisor to plan their planned program of study (PPOS) in order to carry out their work in accordance with applicable laws, regulations, and procedures. Nevertheless, it is solely the student's responsibility to become acquainted with and adhere to Departmental and University rules, regulations, and administrative procedures governing graduate study, including the University's Standards of Conduct detailed in the [Case General Bulletin](#), [Graduate Student Handbook](#), [School of Graduate Studies Statement of Ethics](#), [University Guidelines on Authorship and Policy on Copyright](#), and the [University Policy on Academic Integrity](#).

International students have additional requirements in terms of maintaining visa status. International Student Services (ISS) in the Center for International Affairs is a critical resource for our international students. ISS can be contacted either by email at international@case.edu or visited in person at 143 Tomlinson Hall. It is the international student's responsibility to ensure that they are currently adhering to all requirements set forth by ISS.

Support for Students

Graduate study may be a stressful time for students, revealing a need to engage additional resources. It is helpful to set goals and personal deadlines. Students may consider tutoring support for learning disabilities through Student Affairs/Educational services, and/or counseling through University Counseling Services. University Counseling Services (UCS) and the Divisions of Collegiate Behavioral Health (CBH) and Prevention and Recovery Services (PRS) provide individual, group and couples counseling, psychiatric consultation, psychological and learning disabilities testing, and referrals for community services for all students and their spouses or partners.

Sample Planned Program of Studies (PPOS)

Half-Time Planned Program of Study (PPOS)

Half-Time – Biostatistics Track

	Year 1			Year 2		
	Fall	Spring	Summer	Fall	Spring	Summer
	PQHS 431 - 100	PQHS 432	PQHS 453	PQHS 490	PQHS 459	Practicum/Internship
	PQHS 480	PQHS 435		PQHS 414	Track Elective	
				PQHS 602 - 102(1)		
Total Credits	6 credits	6 credits	3 credits	7 credits	6 credits	3 credits

Half-Time – Genomics and Bioinformatics Track

	Year 1			Year 2		
	Fall	Spring	Summer	Fall	Spring	Summer
	PQHS 431 - 100	PQHS 432	PQHS 453	PQHS 414	PQHS 452	Practicum/Internship
	PQHS 490	PQHS 471		PQHS 451	PQHS 457	
				PQHS 602 - 102(1)		
Total Credits	6 credits	6 credits	3 credits	7 credits	6 credits	3 credits

Half-Time – Healthcare Analytics Track

	Year 1			Year 2		
	Fall	Spring	Summer	Fall	Spring	Summer
	PQHS 431 - 100	PQHS 432	PQHS 453	PQHS 414	Track Elective	Practicum/Internship
	PQHS 490	PQHS 435		PQHS 515	Track Elective	
				PQHS 602 – 102 (1)		
Total Credits	6 credits	6 credits	3 credits	7 credits	6 credits	3 credits

Half-Time – Social and Behavioral Science

	Year 1			Year 2		
	Fall	Spring	Summer	Fall	Spring	Summer
	PQHS 431 - 100	PQHS 432	PQHS 453	PQHS 414	NURS 632	Practicum/Internship
	PQHS 490	PQHS 459		MPHP 482	PSCL/PQHS 412	
				PQHS 602 – 102 (1)		
Total Credits	6 credits	6 credits	3 credits	7 credits	6 credits	3 credits

Intensive (11-month) Planned Program of Study

Intensive Format – Biostatistics Track

Fall	Spring	Summer
PQHS 431 - 100 (3 credits)	PQHS 432 (3 credits)	PQHS 453 (online) (3 credits)
PQHS 490 (3 credits)	PQHS 435 (3 credits)	PQHS 602 (3 credits)
PQHS 414 (3 credits)	PQHS 459 (3 credits)	
PQHS 480 (3 credits)	PQHS 471 or STAT 426 or PQHS 450 (3 credits)	
PQHS 602 – 102 (1 credit)		
13 credits	12 credits	6 credits

Intensive Format – Genomics and Bioinformatics Track

Fall	Spring	Summer
PQHS 431 - 100 (3 credits)	PQHS 432 (3 credits)	PQHS 453 (online) (3 credits)
PQHS 490 (3 credits)	PQHS 452(3 credits)	PQHS 602 (3 credits)
PQHS 414 (3 credits)	PQHS 457 (3 credits)	
PQHS 451 (3 credits)	PQHS 471 (3 credits)	
PQHS 602 – 102 (1 credit)		
13 credits	12 credits	6 credits

Intensive Format – Health Care Analytics Track

Fall	Spring	Summer
PQHS 431 - 100 (3 credits)	PQHS 432 (3 credits)	PQHS 453 (online) (3 credits)
PQHS 490 (3 credits)	PQHS 435 (3 credits)	PQHS 602 (3 credits)
PQHS 414 (3 credits)	Two of the Following:	
PQHS 515 (3 credits)	PQHS 450 (3 credits)	
PQHS 602 – 102 (1 credit)	PQHS 459 (3 credits)	
	PQHS 471 (3 credits)	
	PQHS 500 (3 credits)	
13 credits	12 credits	6 credits

Intensive Format – Social and Behavioral Science Track

Fall	Spring	Summer
PQHS 431 - 100 (3 credits)	PQHS 432 (3 credits)	PQHS 453 (online) (3 credits)
PQHS 490 (3 credits)	NURS 632 (3 credits)	PQHS 602 (3 credits)
PQHS 414 (3 credits)	PQHS 459 (3 credits)	
MPHP 482 (3 credits)	PQHS 412 or PSCL 412 (3 credits)	
PQHS 602 – 102 (1 credit)		
13 credits	12 credits	6 credits

Community of Scholars and Professionals

As a student in the Department of Population and Quantitative Health Sciences, you have joined a community of scholars and professionals. You will be expected to conduct yourself in a manner consistent with this position. While in our program, and in the future as a graduate of our program, you represent our institution, a leading medical school in an esteemed University. This professionalism should be reflected in your interactions (in person, email, text, phone) with faculty, staff, fellow students, guests of our department, collaborative and community partners, and others. Included in this expectation is respect for all people. Behavior that is not consistent with the level of professionalism expected of a scholar and professional may be addressed through University, department and/or program policy.

Professional Commitment and Culture

The MS program in Biostatistics is a degree with a deep commitment to lifelong learning, and students in the program are expected to maintain appropriate professional standards. This includes regular, on-time attendance of classes and participation in a variety of professional development activities. Strong involvement in research, service, and professional social activities is encouraged, with an emphasis on developing impeccable research credentials, independent critical thinking, and problem solving. Students must recognize that voluntary enrollment in this rigorous graduate program may place demands on their time on evenings and weekends, and may prohibit them from taking on outside activities. Students must display maturity of character, interest in the practice of research, excellence in development of interpersonal communication, and high professional commitment to the program of study; they must espouse integrity, honesty, and courtesy, all important professional values.

Disciplinary Policy

Students must adhere to all University, School of Graduate Studies, School of Medicine, and Department policies in regard to academic matters and interpersonal behavior, as well as meet the expectations that come with being a part of a community of scholars and professionals. This includes respect for all people. Behaviors that interfere with another's well-being or ability to perform their responsibilities, learning, or professional development will be considered especially egregious.

Violations may be subject to disciplinary action on the part of the program or department. The nature of the violation, its severity, and history of prior violations will all be considered in any formal disciplinary action taken. Students will receive a letter from the department detailing the reasons for the disciplinary action and any required steps they must complete to return to good standing in the program. Disciplinary actions may include:

- Warning
- Probation
- Suspension from program and University
- Dismissal from program and University

Students who are dismissed from a PQHS program are not automatically eligible for reapplication. Dismissed students must submit a formal petition to the program seeking permission to reapply to the program. All dismissed students granted permission to reapply will be considered as a part of the normal application process.

Reviews of violations will be made under the direction of the program director. All disciplinary decisions will be certified by the Vice Chair for Education. In certain circumstances, the review of violations may be overseen by the Vice Chair for Education instead of the program director.

Examples of behaviors that may result in disciplinary action from the Department:

- Engaging in dishonest behavior: Academic integrity is expected in the MPH Program. Cheating in any form is unacceptable and in violation. This includes:
 - Plagiarism- to avoid plagiarizing, one must give credit whenever one uses: - another person's idea, opinion, or theory - any facts, statistics, graphs, drawings – any pieces of information – that are not common knowledge. - quotations of another person's actual spoken or written words; or a paraphrase of another person's spoken or written words.
 - Copying or helping another student during an assignment/exam.
 - Obtaining examination questions prior to the test.

- Being under the influence of alcohol or chemical substances on campus or at an off campus assignment.
- Any form of unprofessional behavior such as the use of profane or vulgar language on campus or at an off campus assignment, hostility, harassment, stalking, unwanted attention, insubordination, demonstration of uncooperative or negative attitude toward faculty, instructors, clients, or fellow students.
- Violation of University, School of Graduate Studies, Department or Program policies.
- Violation of directives from the University (e.g. Office of Student Conduct, Title IX), School of Graduate Studies, Department or Program.
- Engaging in unethical or unwelcoming behavior while on or during off campus assignment.
- Interfering with an effective learning environment for fellow students, staff, and faculty.
- Behaviors that interfere with the experiences of other students, faculty, staff, community partners, affiliates or external sites that serve as locations for MPH experiences (e.g. practicum, seminar, workshops).

Communication Among Students, Faculty, and Staff

All students enrolled at Case Western Reserve University are given a Case Email address and Network ID. The general format for a CWRU email address is `firstname.lastname@case.edu`. Students also receive a Network ID, which generally consists of their first, middle, and last name initials followed by a number (ex: `abc123@case.edu`). This Network ID will give you access to your Case Webmail account, SIS, and any other University-related login systems that you have access

to. If you use another email account, please ensure that you read both accounts regularly or that you forward the CWRU email to your regular email.

Students are responsible for reading the information and content of communications sent to their Case Email account at least once a day. Faculty, students, and staff often use the CWRU email system to communicate information about courses, seminars, events, etc., particularly when personal notification (e.g. during class) is not possible. You will be held accountable for missed information if you fail to check your email in a timely manner.

Waiving a Course

If a student has taken a course elsewhere that is equivalent to a required course, the student may petition the MS Program Director to waive the course requirement and replace it with an elective. Waiving a requirement does not change the number of credits required at CWRU for the degree. Only petition for transfer of credits (using courses taken elsewhere that were not used towards a degree) can reduce the credit requirement.

If the course taken elsewhere is not deemed equivalent but has large overlap, other options may be considered, e.g. serving as a teaching assistant (TA) for that course.

To request being waived out of a required course, or to replace it, students may petition using the official Petition to Modify Course Requirements, which can be found on the department website. The petition must provide documentation of the relevant courses completed, with a grade of "B" or higher, a detailed description of the course(s), the syllabus, and textbook used in the completed course(s). The petition should be approved by the academic advisor and submitted to the MS Program Director for approval.

The MS Program Director will approach the instructor of the course(s) in question with the petition. The instructor will then evaluate the student's petition, and can either approve or disapprove of the course being waived, or may instead approve replacing the required course with another, advanced course in the same area. In this last case, the replacement

course needs to be specified with a plan for when to take it. Special attention must be paid to prerequisites for this replacement course and when it is offered.

Students can petition to replace a maximum of 2 core courses.

Repeating a Course

Graduate students may petition the Vice Chair for Education to repeat a maximum of two courses during their degree program in order to improve their performance. The appropriate form, together with details of this policy can be found at <http://gradstudies.case.edu/current/forms.html>

Transfer of Credit

Transfer of credit from another university toward degree requirements is awarded for appropriate coursework (not applied to another degree program) taken prior to admission. Transfer of credit should be requested in the student's first academic year, and must be appropriate for the student's planned program of study. Transferred credit is limited to six credits of graduate-level courses, and no credit for a master's thesis may be transferred from another university. No transfer of credit will be awarded towards the MS degree except by petition.

Students who wish to receive credit for courses taken outside the university once they are enrolled must petition for approval. All transfer of credit requires approval from the student's academic advisor, the MS Program Director, and the Dean of Graduate Studies. Such courses must have been taken within five years of first matriculation at CWRU and passed with grades of B or better.

Internal (CWRU) Transfer of Credit

Students of undergraduate programs of Case Western Reserve University who have the approval of the Office of Undergraduate Studies and the School of Graduate Studies may apply to receive credit for graduate courses completed in excess of the undergraduate degree requirements.

Graduate students who internally transfer to another degree program may seek approval to transfer coursework from the original degree program by petition.

Students who initially took program courses as non-degree students and later matriculate into the program, can have these courses transferred so they fully count towards degree requirements. In general, we discourage students from taking many courses non-degree without entering the program as this typically leaves them out of the advising loop and could potentially lead them to take courses that might not count for the program. Students are bound by the program rules in effect when they *officially enter* the program, not from when they started taking courses as a non-degree student.

Ethics in Conducting Research

All MS students must complete their CREC certification prior to beginning their internship/practicum. Upon completion of the online certification program, students should provide the Administrative Director of Non-Clinical Graduate Education a copy of their CREC certification. If a student comes into the program with a current certification, she/he may provide that certification instead; however, if the certification expires within one year, a renewal certificate will be required. Thereafter the student is responsible for recertification upon expiry of the original accreditation. She/he must give the Administrative Director of Non-Clinical Graduate Education the appropriate documents pertaining to recertification within two weeks of obtaining them.

More information regarding CREC certification can be found through the [Office of Research and Technology Management](#).

Academic Integrity

All students are held responsible for the preservation of standards of academic integrity. All forms of academic dishonesty, including forgery, cheating, plagiarism, misrepresentation, and obstruction, are violations of academic integrity standards. Plagiarism includes the presentation, without proper attribution, of another's words or ideas from printed or electronic sources. It is also plagiarism to submit, without the instructor's consent, an assignment in one class previously submitted in another (self-plagiarism).

The University's Academic Integrity Board can sanction violations by issuing failure in the work in question, failure in the course, university disciplinary warning, university disciplinary probation, university disciplinary suspension, or expulsion.

The University also has guidelines on authorship standards. Further details can be found in the

University's policy on Academic Integrity: <http://www.case.edu/gradstudies/current/policies.html>

Changing a Course Grade

If a student needs to have a course grade changed from an incomplete, or from no entered grade, the instructor can change the grade online up to 1 year from the end of the semester. After that time period has elapsed, the instructor will need to fill out and sign a yellow change of grade card, and submit it to the Vice Chair for Education for signature and submission to graduate studies. A guide on how to submit an online grade change can be found [through the University Registrar](#).

Students have an obligation to check their course grades promptly after the end of the semester. On rare occasion, a student may feel the letter grade (A-F) assigned was incorrect or unfair. In such a case, the student needs to contact the instructor immediately. If the instructor feels the student is justified, the instructor may request a grade change using the online grade change form in SIS. Justification for the grade change needs to be included in online form. Once a grade

change has been submitted it will be sent to the Vice Chair for Education and then to the Office of Graduate Studies for approval. This request from the instructor must be made within 30 days of the grade posting to SIS.

Grievance Procedure

Any student who has a grievance should consult, in order, the academic advisor, the MS Program Director, and the Vice Chair for Education (who will refer the case to an appointed grievance committee) and the Department Chair. Further, the School of Graduate Studies has a general policy to assure that all students enrolled for graduate credit at Case Western Reserve University have adequate access to faculty and administrative consideration of their grievances concerning academic issues. A three-step procedure has been established for graduate students to present complaints about academic actions they feel are unfair. These policies are detailed in the [Student Code of Conduct](#).

Leaves of Absence

All students who are admitted to the MS program in the Department of Population and Quantitative Health Sciences are expected to pursue their studies according to a systematic plan with continuous enrollment in successive fall and spring semesters. If it becomes necessary for a student to interrupt studies before completion of the degree, the student must request, in writing to the Vice Chair for Education, a leave of absence. The leave does not ordinarily extend the time limit to complete the degree (see Graduation below). Leaves of absence may not exceed two consecutive academic semesters, and the maximum amount of leave permitted per graduate program is four semesters. Petitions for a leave of absence require a form available from the School of Graduate Studies and require the approval of the student's academic advisor, Vice Chair for Education and Dean of Graduate Studies. Leaves of absence may be used for the medical conditions related to pregnancy and childbirth.

Many international students are not eligible to take a leave without jeopardizing their student status; prior approval from International Student Services is required.

Maintenance of Good Standing

To remain in good standing within the MS program, students must satisfy the following conditions:

- Respond in a timely manner to all department communications requiring it (check Case e-mail!).
- Register each fall and spring semester unless on an official leave of absence that has been approved by the School of Graduate Studies.
- Maintain a minimum cumulative graduate GPA of 3.00 in all graduate work.
- Receive a grade no lower than a "B" in any of the required core courses and a grade no lower than a "C" in any other course being used for the degree. If illness or other circumstances intervene, the student must notify the course instructor and advisor as soon as possible.
- Satisfy all program deadlines and time limits as outlined in the Academic Guide.
- Remove Incomplete (I) grades within one semester, or by the time specified by the course instructor.
- Complete written report from internship/practicum

Graduation

To receive a degree, the student is required to apply for graduation through the Student Information System (SIS) in the Office of Graduate Studies before the posted deadline during the semester the student expects to complete all degree requirements, and must be registered during the semester in which the degree is awarded. It is the responsibility of the student to secure signatures and return the necessary forms to the Office of Graduate Studies on time. Each student who applies for graduation should consult the [calendar](#) from the School of Graduate Studies for the various deadlines. Questions about graduation can be directed to the Administrative Director of Non-Clinical Graduate Education.

All MS students need a minimum GPA of 3.0 to graduate, and have a maximum of 5 years from matriculation to complete the degree requirements. Students who fail to complete the degree requirements after 5 years may petition the Office of Graduate Studies for an extension. This petition must be approved by the academic advisor, the MS Program Director, and the Vice Chair for Education for the department.

Waiver of Registration

It is a requirement of the School of Graduate Studies that a student be registered for credit in the semester in which he or she completes all the requirements to graduate in accordance with established deadlines for that semester. If a student will not be able to meet the degree requirements to graduate in one semester, but will finish before the next semester begins, they can graduate in the following semester and apply for a waiver of the requirement to be registered in the semester of graduation. To be granted automatically a waiver of registration, students must be registered in the semester immediately preceding the semester of graduation, complete all degree requirements including an application to graduate in the new semester, and submit a copy of all required materials to the Administrative Director of Non-Clinical Graduate Education and the originals to the School of Graduate Studies by the end of the Drop/Add period of the next semester.

A student who qualifies for the waiver will be awarded the degree at the next graduation without the need to be registered. If a student fails to meet the waiver deadline, he or she will be required to register for at least 1 credit in the next semester, and to reapply for graduation in that semester.

Summary of Deadlines

Application Submission	June 30 th of each year.
Application Decision	July 31 st of each year
Deadline to submit a form indicating that the student has read the Handbook <i>(to be submitted to Administrative Director)</i>	September 15 th of the first semester of study
Plan of Study <i>(submitted via SIS)</i>	October 15 th of the first semester of study
University Calendar of Deadlines:	https://case.edu/gradstudies/current-students/dates-
Commonly Used Forms:	https://case.edu/gradstudies/current-students/forms