

# Northwestern University MS in Biostatistics Student Handbook Academic Year 2024-2025



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***\*The Program in Public Health reserves the right to change without notice any statement in this publication concerning but not limited to, rules, policies, tuition, fees, curricula, and courses.***

## Mission

The mission of the Master of Science (MS) in Biostatistics program at Northwestern University is to provide graduate biostatistics training for students who intend to plan, direct, and execute health research and/or analyze health data.

## Values

The values of the faculty, students, and staff of the NU Program in Public Health (PPH) are:

1. Professional integrity in education, research, and service
2. Compassion, equity, and social justice in defining and addressing health
3. Multidisciplinary collaborative approaches to problems
4. Respect for and inclusion of diversity and community

## The Graduate School Diversity Statement

A diverse student population is a key element of the educational experience of students in The Graduate School (TGS). Diversity presents itself in many different forms such as: socioeconomic status, race or ethnicity, religion, gender identity, gender expression, sexual orientation, nationality or place of origin, disability, unique work or life experience, etc. It is the goal of TGS to cultivate an environment that values diverse backgrounds, approaches, and perspectives—all essential ingredients for true academic excellence.

## Land Acknowledgement

We recognize and acknowledge that Northwestern University Feinberg School of Medicine sits on the land of multiple Native nations. We acknowledge and honor the original peoples of the Chicagoland area - the Three Fires Confederacy, Potawatomi, Odawa and Ojibwe Nations, as well as other Tribal Nations that know this area as their ancestral homeland, including the Menominee, Ho-Chunk, Miami, Peoria, and Sac and Fox.

These lands were the traditional birthright of Indigenous peoples who were forcibly removed and who have faced two centuries of struggle for survival and identity in the wake of dispossession. We acknowledge the ground on which we stand so that all who come here know that we recognize our responsibilities to the peoples of that land and that we strive to address that history so that it guides our work in the present and the future.

We further acknowledge that this land is the current home to one of the largest urban Native American communities in the United States. Native people are part of Chicago's past, present, and future, and it is our responsibility to acknowledge these Nations and to work with them as we move forward as a more inclusive institution.

*Land acknowledgement by the [Association of Native American Medical Students](#)*

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## Overview

The Program in Public Health (PPH) began at Northwestern in 1996 and received its first accreditation by the Council on Education for Public Health (CEPH) in 2003.

PPH was developed as an in-person program. We require in-person activity for students to make timely progress towards their degree. The program will offer a mixture of hybrid and remote only courses on a case-by-case basis each quarter while following state and CDC guidelines.

PPH is located within the Feinberg School of Medicine (FSM). The administrative home for PPH is the Institute for Public Health and Medicine (IPHAM). IPHAM was established in 2012, pursuing the mission of *advancing collaborative research and education to improve the health and well-being of individuals and their communities*. The Graduate School (TGS) at Northwestern provides the academic administrative structure for the PPH. The mission of TGS is to *be a trusted, responsive, visionary leader and partner to maintain and promote the highest quality master's and doctoral education*. Like IPHAM, TGS collaborates with PPH to guide and sustain an institutional culture that facilitates excellence in teaching, innovation and rigor in research, and the personal and intellectual growth of its diverse student population.

## MS Systems and Procedures

### Advisors

All advisors must have a primary or secondary appointment in the Department of Preventive Medicine and with the PPH. This requirement is in place to ensure that the faculty advisor is familiar with the academic requirements for the MS degree and the course offerings in The Graduate School. However, a student is welcome to seek additional counsel from other faculty members at Northwestern University or researchers affiliated with the types of institutions where the student thinks he/she/they might like to work. In many cases, PPH/MS faculty can facilitate connections between students and researchers in settings where students might wish to continue their careers. **While there may be some overlap, a student's academic advisor is generally different from his/her/their thesis advisor.**

### Advising Assignments

Student **academic advisors** will be assigned according to the students' selected concentration. For example, the Director of the Concentration in Statistical Methods and Practice will advise those students declaring that concentration, the Director of the Concentration in Population Health Analytics will advise the students within that concentration, and so on. Concentration declarations occur in the Fall quarter. The faculty advisor is meant to serve as a resource for students to ask questions about coursework, research opportunities and career goals. While in many cases the initial assignment will prove satisfactory, the student's and/or the advisor's needs may be better served by another advisor/advisee relationship. Changing advisors is a straightforward process whereby the student should identify a new faculty member who is willing to serve as his/her advisor. As a matter of courtesy, the student should then notify the previous advisor about the change. No justification of the decision is required. Program in Public Health (PPH) staff should be notified when the change has been agreed upon and all parties have been notified.

## Communication

The advisor/advisee relationship is most productive when both parties clearly define expectations. Establishing good communication at the outset will increase the likelihood of a good relationship. We recommend that students regularly evaluate whether the advising relationship meets their needs and consider areas for improvement. Students are encouraged to openly discuss concerns and identify solutions with their advisors or PPH staff. Below are some topics relevant to the advisor/advisee relationship that students should consider discussing at their first meeting. These guidelines apply to both the academic advisor/advisee relationship and the thesis advisor/advisee relationship:

- Preferred method (e.g., telephone, e-mail) and style (e.g., walk-in, schedule appointment directly with advisor or through administrative assistant) of communication
- Frequency of meetings
- Whose responsibility it is to initiate meetings
- Role in course planning (e.g., does the advisor wish to provide input/suggestions on elective courses before registration)
- Role of advisor on assessing student performance and progress towards degree
- What the advisor's role is in professional development activities (e.g., resume and cover letter preparation, job search strategies, workshop participation)

## Final Thesis Project Advising

Contingent upon agreement by all involved parties, some students' primary academic advisor may also serve as their primary thesis advisor. However, most students' final thesis project advisor(s) will be faculty other than their academic advisor.

## PPH Student Senate

The goals of the Student Senate are to:

- Represent the desires of the student body in the course of administrative decision making
- Facilitate communication between students, faculty, and administration
- Solidify the position of students as valued stakeholders in the Program
- Support student activities and initiatives

The Student Senate is composed of nine members: eight senators and a president. The senators are elected from the MD/MPH, MPH, PhD/MPH, MS in Epidemiology, and MS in Biostatistics student bodies. Senators fill the student seats of the standing committees in the Program in Public Health. If no senator volunteers for a committee seat, the president may nominate a senator to that seat

See <https://sites.northwestern.edu/pphsenate/> for more information about the Student Senate. You can reach the Student Senate at [nupphsenate@gmail.com](mailto:nupphsenate@gmail.com)

## Graduate Student Tracking System (GSTS)

<https://gsts.northwestern.edu/site/login>

GSTS makes it possible for the MS in Biostatistics program to effectively track your progress. Use of GSTS will help guide sessions held with your advisor. We recommend focusing on the following two areas:

1. **Plan of Study:** This tab allows you to see which courses you have taken; it is a good tool to use for course advising purposes. Following orientation, students should schedule individual

appointments with Maureen Moran, m-moran@northwestern.edu, to complete their plan of study.

2. **Academic Progress:** This tab is used to collect baseline information about your anticipated graduation year/quarter and progress towards your degree completion.
3. **Documents:** This tab can be used to upload PDF documents. Following orientation, new students will complete their initial plan of study worksheet, save it as a PDF and upload it into the Documents section of GSTS. Students are expected to review their plan of study with advisors quarterly. Students should save the plan of study worksheet in case an updated pdf is needed due to changes in the coursework taken. In the event of changes to the uploaded plan of study, a new plan of study should be uploaded after consulting with an advisor.
4. **TGS Forms:** This tab provides a place to “create new form” including the forms required to take a leave of absence, apply for the degree, and note details of degree completion.

## MS in Biostatistics Academics

In order to prepare students to pursue research in a broad range of topics, the degree requirements for the MS in Biostatistics were developed to teach students biostatistical reasoning and study design methods needed to carry out sound scientific research. Three Concentrations foster curriculum flexibility to meet a range of professional needs and interests.

The Concentration in **Population Health Analytics** is designed for college graduates or students with professional degrees (e.g., MD, DPT, allied health professionals) who intend to plan, direct and execute health research. Emphasis is placed on both biostatistical and epidemiological methods for population health research.

The Concentration in **Statistical Bioinformatics** is designed for college graduates who are interested in working as statistical analysts/programmers on research teams. Statistical Bioinformatics emphasizes cutting-edge computation and analysis for genomics and other bioinformatics ‘big data’.

The Concentration in **Statistical Methods and Practice** is also designed for college graduates who are interested in working as statistical analysts/programmers on research teams. Statistical Methods and Practice encompasses a broad range of statistical theory and methods for data analysis from health and medical research settings.

### MS Competency-Based Education

Northwestern University’s MS-Biostatistics degree is competency-based. The MS degree is accredited as an “Academic Degree” by the Council on Education for Public Health (CEPH). PPH ensures that MS education is grounded in 12 foundational public health knowledge learning objectives, 11 MS competencies, and (when applicable) five (5) degree concentration competencies.

### Graduate-Level Foundational Public Health Knowledge

The foundational public health knowledge learning objectives prepare MS students to substantively address scientific and analytic approaches to the discovery and translation of public health knowledge in the context of a population health framework. Upon completion of required coursework, all students earning the MS in Biostatistics should be able to:

- D1.1. Explain public health history, philosophy, and values
- D1.2. Identify the core functions of public health and the 10 Essential Services



- D1.3. Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health
- D1.4. List major causes and trends of morbidity and mortality in the US or other community relevant to the school or program
- D1.5. Discuss the science of primary, secondary & tertiary prevention in population health, including health promotion, screening, etc.
- D1.6. Explain the critical importance of evidence in advancing public health knowledge
- D1.7. Explain effects of environmental factors on a population's health
- D1.8. Explain biological and genetic factors that affect a population's health
- D1.9. Explain behavioral and psychological factors that affect a population's health
- D1.10. Explain the social, political, and economic determinants of health and how they contribute to population health and health inequities
- D1.11. Explain how globalization affects global burdens of disease
- D1.12. Explain an ecological perspective on the connections among human health, animal health and ecosystem health (e.g., One Health)

## **MS in Biostatistics Competencies**

Upon completion of required coursework, all students earning the MS in Biostatistics should be able to:

- MSB1. Apply classic methods for continuous and categorical data analysis, including regression and other appropriate statistical approaches.
- MSB2. Use computer-based statistical analysis package(s) to manage data.
- MSB3. Develop visualized data using computer-based statistical analysis package(s).
- MSB4. Analyze data employing computer-based statistical analysis package(s).
- MSB5. Implement sample size and power calculations for a range of experimental designs.
- MSB6. Interpret results of a health research study, including the relation to findings from other studies, potential biological or social mechanisms, study limitations, and public health implications.
- MSB7. Communicate written and oral findings in a scientifically sound manner.
- MSB8. Calculate epidemiological measures of association between risk factors and disease.
- MSB9. Apply methods and strategies to evaluate and reduce bias in health research.
- MSB10. Use criteria to distinguish between association and causality.
- MSB11. Apply ethical and regulatory standards to human subjects research.

## **Concentration-Specific Competencies**

### **Concentration in Population Health Analytics**

- PHA1. Design an epidemiologic study to address a question of interest;
- PHA2. Describe practical considerations for the conduct of health research studies;
- PHA3. Access publicly available data resources for population health research;
- PHA4. Critically review the scientific literature, synthesize findings across studies, and make appropriate recommendations based on current knowledge; and
- PHA5. Develop a clear description of the rationale, methods, results, and overall interpretation of an epidemiologic investigation.

### **Concentration in Statistical Bioinformatics**

- SP1. Develop computer files of high-dimensional data for analysis using high performance computing data management techniques;
- SP2. Determine and execute appropriate statistical analyses, in particular techniques relevant to bioinformatics, to address a study question;
- SP3. Access publicly available databases for bioinformatics research;
- SP4. Develop statistical and bioinformatics analysis results in written, graphical and verbal format in response to an analysis request; and
- SP5. Identify theoretical underpinnings of advanced statistical models.

### **Concentration in Statistical Methods and Practice:**

- SMP1. Develop computer files of raw data for analysis using data management and statistical analysis software;
- SMP2. Execute appropriate statistical analyses to address a study question;
- SMP3. Apply classic methods for the analysis of time-to-event and clinical trial data;
- SMP4. Develop statistical analysis results in written and verbal format in response to an analysis request; and
- SMP5. Identify theoretical underpinnings of advanced statistical models.

## Course Requirements

Students are required to earn 14 units to complete the MS in Biostatistics. Core courses are required for all concentrations

### Core Courses (7 units)

BIOSTAT 301 Introduction to Epidemiology (1)  
BIOSTAT 302 Introduction to Biostatistics (1)  
BIOSTAT 305 Data Management and Analysis in SAS (1)  
BIOSTAT 306 R Programming (1)  
BIOSTAT 401 Intermediate Epidemiology (1)  
BIOSTAT 402 Intermediate Biostatistics (1)  
PUB\_HLTH 441 Ethical Issues in Clinical Research (0.5)  
BIOSTAT 561 Thesis (0.5)

### Concentration in Population Health Analytics

#### **Additional Required Courses (4 units):**

BIOSTAT 446 Design, Conduct, and Analysis of Clinical Trials (1)  
BIOSTAT 501 Advanced Epidemiology (1)  
BIOSTAT 560 Statistical Consulting (0.5)  
BIOSTAT 565 Clinical Database Management (0.5)  
PUB\_HLTH 445 Writing and Peer Reviewing for Publication (1)

#### **Selectives (Choose 1 unit):**

PUB\_HLTH 412 Infectious Disease Epidemiology and Prevention (1)  
PUB\_HLTH 524 Cardiovascular Epidemiology (1)  
PUB\_HLTH 525 Cancer Epidemiology (1)  
BIOSTAT 499 Independent Study of Epidemiologic Methods in a Discipline-Specific Context (0.5 or 1)

#### **Electives (Choose 2 units)\***

### Concentration in Statistical Bioinformatics

#### **Additional Required Courses (4 units):**

BIOSTAT 303 Introduction to Probability Theory (1)  
BIOSTAT 403 Statistical Inference (1)  
BIOSTAT 502 Advanced Biostatistics (1)  
BIOSTAT 529 Statistical Genomics and Genetic Data Analysis (1)

#### **Selectives:**

##### Choose 1 Unit

BIOSTAT 305 Data Management and Analysis in SAS (1)  
HSIP 441 Health and Biomedical Informatics Methods I (1)

##### Choose 1 Unit

BIOSTAT 445 Introduction to Statistical Learning (1)  
BIOSTAT 522 Network Data Analysis (.5)  
HSIP 442 Biomedical Informatics Methods II (1)

#### **Electives (Choose 1.5 units)**

## Concentration in Statistical Methods & Practice

### **Additional Required Courses (4.5 units):**

BIOSTAT 303 Introduction to Probability Theory (1)

BIOSTAT 403 Statistical Inference (1)

BIOSTAT 446 Design, Conduct, and Analysis of Clinical Trials (1)

BIOSTAT 502 Advanced Biostatistics (1)

BIOSTAT 521 Survival Analysis (1)

BIOSTAT 560 Statistical Consulting (0.5)

### **Electives (Choose 2.5 units)**

## Possible Electives

Required courses or selectives from one concentration may be taken as electives for another concentration. Students may incorporate other courses offered in The Graduate School into their training with the approval of the PPH Curriculum Committee. See the Non-PPH Elective Form for procedures and deadlines.

Approved electives (a '\*' denotes that this elective may be a requirement already, depending on concentration):

- PUB\_HLTH 301 Behavior, Society, and Health (1)
- PUB\_HLTH 303 Environmental Health Sciences (1)
- PUB\_HLTH 320 The Role of Community in Public Health (1)
- PUB\_HLTH 390 Introduction to International Public Health (1) (winter quarter even numbered years)
- PUB\_HLTH 412 Infectious Disease Epidemiology and Prevention (1)
- PUB\_HLTH 415 Disease Prevention and Health Promotion: Principles and Applications (1)
- PUB\_HLTH 416 Program Evaluation (1)
- PUB\_HLTH 417 Public Health Law: Promoting Healthy Youth Development (1)
- PUB\_HLTH 420 Introduction to Health Management (1)
- PUB\_HLTH 435 Health Services Research Design (1)
- PUB\_HLTH 439 Qualitative Research Methods (1)
- PUB\_HLTH 443 Humanitarian Response and Health (1)
- PUB\_HLTH 445 Writing and Peer Reviewing for Publication\* (1)
- PUB\_HLTH 449 Public Health Policy (1)
- PUB\_HLTH 524 Cardiovascular Epidemiology (1)
- BIOSTAT 303 Introduction to Probability Theory\* (1)
- BIOSTAT 403 Statistical Inference\* (1)
- BIOSTAT 429 Systematic Review / Meta-Analysis (1)
  
- BIOSTAT 445 Statistical Learning\* (1)
- BIOSTAT 446 Design, Conduct, and Analysis of Clinical Trials\* (1)
- BIOSTAT 449 Independent Study of Approved Topic (0.5 to 1.0)
- BIOSTAT 502 Advanced Biostatistics\* (1)
- BIOSTAT 521 Survival Analysis\* (1)
- BIOSTAT 522 Network Data Analysis (0.5)
  
- BIOSTAT 527 Statistical Methods for Missing Data (0.5)
- BIOSTAT 529 Genomics and Genetic Data Analysis\* (1)
- BIOSTAT 560 Statistical Consulting\* (0.5)
- BIOSTAT 565 Clinical Database Management\* (0.5)

## Thesis Requirements for all Concentrations

\*All master's thesis-related inquiries should be sent to [biostat.thesis@northwestern.edu](mailto:biostat.thesis@northwestern.edu)

### Master's Thesis Topic Proposal – Due: Fall Quarter (exact date to be posted on Canvas)

All MS in Biostatistics students are required to formally submit a thesis topic proposal and advisor declaration form. The topic proposal will include a preliminary title with research hypotheses, a description of the data source, and it must include both primary and secondary advisor names and signatures. Students will be provided the submission guidelines at the beginning of the Fall quarter. The topic proposal and advisor declarations will be submitted on the same form.

### Master's Thesis Advisors – Due: Fall Quarter (exact date to be posted on Canvas)

The master's thesis is supervised and read by the student's thesis advisors. The **primary thesis advisor** must be a Biostatistics or Epidemiology faculty member in the Department of Preventive Medicine. Early in the program, the director of the thesis efforts (Adin-Cristian Andrei) will organize and help pair students with a primary faculty advisor if they have not yet identified one on their own. The **secondary thesis advisor** may be a faculty member from another department but will generally be a specialist from the applied field relevant to the student's thesis and/or the secondary advisor will provide the study dataset. The formal thesis advisors must be declared at the same time as the topic proposal, through submission to Canvas.

When the final draft of the thesis is submitted, students will be required to submit a thesis approval form, signed by their thesis advisors along with their final thesis document, indicating the advisors have read and approved the final draft of the thesis.

### Master's Thesis Project Proposal – Due Winter Quarter of Graduation Year (exact date to be posted on Canvas)

All MS students will submit a formal project proposal that will include: project title, research team members, scientific background and rationale, study question, hypothesis, sources of data, data analysis plan(s), and references. The proposal format will be provided via Canvas during the Fall quarter. The director of the thesis projects (Adi-Cristian Andrei) will review the proposals to ensure they meet requirements for the master's program. He or a representative (from the Thesis Review Committee or from the MS Leadership) will provide comments and feedback (or recommend modifications) within two weeks of submission.

### Preliminary Results – Due Winter Quarter of Graduation Year (exact date to be posted on Canvas)

All MS students will submit a set of draft tables and figures that they envision will be included in their final thesis manuscripts. At minimum, there should be two tables and one figure. These tables and figures should include publication-ready formatting and labeling, which will help faculty to monitor student progress. Submissions will occur via Canvas, and the director of the thesis project or a representative will review these submissions and provide feedback within two weeks of submission.

### Original Research Manuscript – Due Spring Quarter of Graduation Year (exact date to be posted on Canvas)

The master's thesis is meant to provide an opportunity for students to demonstrate mastery of the skills they acquire in coursework and through research experience. A manuscript-style thesis not only

meets the requirements for the master's degree, but also produces a relevant 'product' that can help advance the student's career if it is accepted by a peer-reviewed journal for publication.

The final master's thesis product may vary in format. In general, it will take the form of a *publishable* (i.e., ready for submission to a peer-reviewed journal) manuscript. It will be approximately 2500-3500 words. Formatting should meet target journal submission requirements. The manuscript must contain at minimum, the following sections:

- Abstract
- Introduction
- Methods
- Results
- Conclusions
- Two tables in publication-ready format
- One figure in publication-ready format

Examples of acceptable thesis projects include: studies in the area of human subjects' research (i.e., involving appropriately de-identified human data), statistical/bioinformatics methods and/or simulation studies exploring statistical/bioinformatics methods, creation of software (e.g., R) packages, secondary data analysis, or meta-analyses. Examples of unacceptable thesis projects include: non-quantitative literature review and studies based on non-human subjects' research. To ensure adequacy of thesis topics, students will submit a topic proposal in the Fall. All inquiries regarding acceptability of topics may be sent to [biostat.thesis@northwestern.edu](mailto:biostat.thesis@northwestern.edu).

Although there is no minimum sample size requirement that defines an epidemiologic study, most often samples are large (>100 participants) and participants are commonly selected in a manner that makes them representative of some larger population. Preparing study protocols, obtaining IRB approval, recruiting and identifying participants, collecting measurements, and analyzing data are each time-consuming activities that often require financial support (particularly data collection). Most often, proposing to collect new data for an epidemiologic study is too ambitious for students to complete during the short time in which they are enrolled in the MS program. However, it is possible that some students may already have an identified research area and may work on projects beginning with the collection of new data that the student will be permitted to analyze for his/her research project. It may also be appropriate for a student to collect 'pilot' data (a small sample) in order to generate some preliminary effect estimates to use in a grant application to justify a larger study. If such activities are placed in the proper context in the thesis proposal form, they are likely to be approved. **Studies that are not conducted in a human population are not acceptable.**

In most cases, secondary data analyses will be the most feasible research projects given the financial and time constraints associated with collecting epidemiologic data. **A literature review or non-quantitative review is not acceptable.** There are a number of publicly available sources for research data, such as data collected by the National Center for Health Statistics (<http://www.cdc.gov/nchs/>) or data that are publicly available because they were collected with funding from the National Institutes of Health (NIH). The Department of Preventive Medicine also houses a number of cohort and cross-sectional studies that may be appropriate sources of data for students to use to complete their master's degree thesis.

Additionally, there are investigators throughout the Feinberg School of Medicine who may also have collected data to address one question, but have considerable additional data that students

can use to address new research questions. Students should discuss their research interests with their advisors, course instructors, and research mentors who can facilitate finding secondary data sources or providing logistical and financial support for potential thesis projects.

### Evaluation of Master’s Thesis

The Thesis Review Committee will review the final thesis product according to a structured rubric. The thesis guidelines and rubric explain the methods through which faculty assess the theses with regard to students’ demonstration of the MS degree competencies and mastery of skills. All department-affiliated faculty who are supervising master’s theses are welcome to consult with the Thesis Review Committee or Adin-Cristian Andrei about what constitutes a project of acceptable quality to serve as a master’s thesis. The student’s master’s thesis advisor(s) is/are encouraged to provide regular feedback to students to ensure that theses will ultimately be approved by the Thesis Review Committee. All students must enroll in BIOSTAT 561 (0.5) in the Spring quarter prior to graduation. Prior to the start of the Spring quarter, they must have submitted initial data analysis/results. During the Winter quarter and the first several weeks of the Spring quarter, the instructor (Adin-Cristian Andrei) will work with students to provide feedback and direction for completion of manuscript writing. There will be additional milestones (e.g., an oral presentation) the students must meet and pass as part of the BIOSTAT 561 credit. Students must pass BIOSTAT 561 course *and* the Thesis Review Committee must approve the final thesis document in order for students to be eligible for graduation.

### Timeline

The table below illustrates the timeline for completion of thesis milestones.

Requirements	Date	Where to submit
<b>Initial consideration of research topic + project/advisor pairing</b>	Summer / Fall	N/A; Discuss with advisor/ research mentor.
<b>Submit Form #1 topic proposal and formal advisor declaration</b>	Fall Quarter (date specified in Canvas)	Electronic copy uploaded to Canvas (Biostat 561) by date and time specified.
<b>Thesis Proposal (Form #2)</b>	Winter Quarter (date specified in Canvas)	Electronic copy uploaded to Canvas (Biostat 561) by date and time specified.
<b>Submit Preliminary Data Analysis Results (Tables and Figures)</b>	Winter Quarter (date specified in Canvas)	Electronic copy uploaded to Canvas (Biostat 561) by date and time specified.



**Completed Master's Thesis and Form #3**

Spring Quarter      Electronic files uploaded to Canvas  
(date specified in      (Biostat 561) by date and time specified.  
Canvas)

**Failure to meet the deadline will delay graduation.** In the event that the final version of the thesis is not awarded a passing grade, the student must continue to revise the thesis until it is judged by the Thesis Review Committee to be of passing quality. This process will result in graduation being delayed until the end of summer quarter or later.

## Software Recommendations

The majority of MS courses and the student thesis projects require the use of statistical software. Course instructors and advisors have varied preferences for different analysis software packages, and students will be trained to use SAS and R, the two most common statistical analysis packages. Although certain course instructors may require the use of one or another, students should work with their thesis advisors to agree upon the program they will use for their master's thesis.

Proficiency in SAS is a required skill for many statistical analyst positions, and SAS is commonly used in the biomedical research field. SAS is installed in the PPH student lab for student use and is available in the Galter Health Sciences Library. Students are strongly encouraged to purchase a student/university version of the SAS license. They may refer to Northwestern University's IT website for resources and options in accessing SAS (<https://www.it.northwestern.edu/software/sas/index.html>).

R is a free powerful statistical analysis software program that is also commonly used in the statistical community. Students will have the opportunity to learn to use R software and it is free and easy to download onto personal computers. R can be downloaded through the following website:

<http://www.r-project.org/>.

## Transfer Credit and Course Placement Policy

### Transfer Credit

Requires transcript review by the Director of Graduate Affairs and documentation in GSTS of the coursework for which transfer credit is being applied.

- From a School or Program in Public Health:
  - Graduate level coursework taken from a CEPH accredited school or program.
  - Grade of B or higher (if graded).
  - Taken within the past 5 years.
  - Maximum units that can be transferred equals number of units needed to earn the degree minus 9.
- From a Graduate or Professional School:
  - Graduate or professional level coursework taken at an accredited school or university.
  - Grade of B or higher (if graded).
  - Taken within the past 8 years.
  - Up to 2 units may be transferred.

## Placement

NOTE: placing out of a course does not change the number of credits required for graduation.

Placing into an Upper-Level Course (e.g., Intermediate Biostatistics and Intermediate Epidemiology):

- Decisions are made on a case-by-case basis.
- No credit will be granted for lower-level pre-requisite courses not taken due to this policy.
- If course was taken from a School or Program in Public Health:
  - Graduate level coursework taken from a CEPH accredited school or program.
  - Grade of B or higher (if graded).
  - Taken within the past 5 years.
- From a Graduate or Professional School:
  - Graduate or professional level coursework taken at an accredited school or university.
  - Grade of B or higher (if graded).
  - Taken within the past 5 years.
- If course was taken as an undergraduate:
  - Within the past 5 years
  - Students will be offered a placement exam and must receive a grade of 90% or higher to place out of the introductory course.

## Grades

The MS in Biostatistics follows The Graduate School policy on grading:

<https://www.tgs.northwestern.edu/academic-policies-procedures/policies/general-registration-policies.html#grades>

## Transcripts

A current student may obtain an unofficial Transcript from CAESAR through

<https://caesar.northwestern.edu/>. Graduates and inactive students in need of an official graduate school transcript should contact the Evanston office:

Transcript Department  
Office of the Registrar  
Northwestern University  
633 Clark Street  
Evanston, IL 60208  
(847) 491-5234

Complete details, including fees and restrictions are available online

[http://www.registrar.northwestern.edu/academic\\_records/obtaining\\_a\\_transcript.html](http://www.registrar.northwestern.edu/academic_records/obtaining_a_transcript.html)

## Registration Policies

Students register online; registration opens 6-8 weeks before the quarter begins for students who are continuing their studies; students in their first quarter of study may not register until the week before classes begin.

Use CAESAR (Computer Assisted Electronic Student Access Route) available at

<http://www.registrar.northwestern.edu/> (accessible using your NU NetID and password) to register for classes. The Registrar's office has a tip sheet, available at [http://ses.northwestern.edu/documentation/SC\\_Registration\\_Tip\\_Sheet\\_v9.pdf](http://ses.northwestern.edu/documentation/SC_Registration_Tip_Sheet_v9.pdf).

## Permission Numbers

Students in the MS-Biostatistics Program should NOT need permission numbers for any courses. There is one exception BIOSTAT 499. To obtain a permission number, email: [pphregistration@northwestern.edu](mailto:pphregistration@northwestern.edu).

## Continuous Registration Policy

The Graduate School (TGS) policy requires that all students be registered in their graduate program at Northwestern University in each of the fall, winter and spring terms until all degree requirements have been completed. This is called 'continuous registration'. See [Continuous Registration Policy](#) for more information.

Students enrolled in Continuous Registration must be making progress toward their degree. Combined degree students demonstrate this by continued enrollment in their other degree program. Students not enrolled in a combined degree program who enroll in Continuous Registration must demonstrate through regular (at a minimum, monthly) check-ins with the program director or the director's designee that they are actively making progress toward the degree. Making progress toward the degree might be demonstrated by completion of assignments for which a grade of incomplete was assigned, agreed upon interim steps toward completion of the thesis.

Failure to make academic progress over two quarters will result in academic probation of one quarter after which the student may be dismissed.

Students who are not registered for classes (or Thesis) but unable to make progress toward the degree during a given quarter (excluding summer), should apply for a leave of absence.

This policy does not apply to students who have been approved for a leave of absence. See <https://www.tgs.northwestern.edu/academic-policies-procedures/policies/leaves-of-absence.html> for more information about TGS leave of absence policies.

A non-registered student will be deactivated and must apply for readmission. See [Leaves, Withdrawal & Readmission](#) for more information.

## Leave of Absence

Leaves of Absence is defined as a temporary separation from the University for a **minimum of one quarter and a maximum of one year**. Students who wish or need to interrupt their progress towards the degree may petition for a leave of absence. During a leave of absence, students are not permitted to enroll at the University and will not be considered active students. For more information visit, <https://www.tgs.northwestern.edu/academic-policies-procedures/leaves-withdrawal-readmission.html>.

## Student Resources

### Counseling & Psychological Services (CAPS)

The Chicago CAPS office provides a variety of services for graduate and professional students whose programs are located on Northwestern University's Chicago Campus. Visit the website below to learn more <https://www.northwestern.edu/caps-chicago/index.html>

### 633 North Saint Clair Street Building Access Card

To access the 633 building, including the Student Lab and Program in Public Health administrative offices, you need a key card which can be requested from program staff. Your card is registered to you, and you should not share it with others. Anyone entering or leaving the building after 6pm must sign in and out or swipe their card. The key card must be scanned after hours to access the 20<sup>th</sup> floor via the

elevator. All key cards must be returned before you leave the program – whether you are graduating or taking a Leave of Absence. If you lose the 633 building key card please report it immediately to program staff.

### **Student Lab**

All students in the Program in Public Health can use the student study space located in the 633 N. Saint Clair building, 20th floor. You will need a 633 N. Saint Clair building access card.

All Program in Public Health students (this includes MPH and MS students) share this space.

### **Library Services**

There are two libraries on the Chicago Campus: The Galter Health Sciences Library, and the Pritzker Legal Research Center.

#### **The Galter Health Sciences Library**

The Galter Health Sciences Library, located in the Ward Building, is the primary resource for students in the Program in Public Health. Many resources are available electronically through <http://www.galter.northwestern.edu/>. You may need to use a VPN (virtual private network) to access some library resources from off campus.

#### **The Pritzker Legal Research Center**

Located within the law school at 357 East Chicago Avenue, the Center's hours, policies and holdings are described at: <http://www.law.northwestern.edu/lawlibrary>. Resources available at the Center that may be of special interest to public health students include AccessUN, a database that provides access to current and retrospective United Nations documents and publications.

### **WildCARD and Building Access**

The WildCARD is the Northwestern University identification card, issued to all students, faculty and staff. This card is your photo identification and all-purpose card on campus. Refer to the following for more information on this card:

<https://www.tgs.northwestern.edu/services-support/community-campus-life/the-wildcard.html>

For more information about retail store discounts and other benefits of your WildCARD, check out <http://www.northwestern.edu/wildcard/>

### **Tuition and Billing**

Tuition is billed the first of the month after registering for a class. Tuition bills must be paid before the student will be permitted to register in a subsequent quarter. Questions about tuition bills should be addressed to Student Accounts at (312) 503-8503, [studentaccounts-chicago@northwestern.edu](mailto:studentaccounts-chicago@northwestern.edu)

Tuition rates for MS students can be found at: <http://www.northwestern.edu/sfs/tuition/graduate/the-graduate-school.html>

## **The Graduate School (TGS) Important Policies**

### **Immunization Records**

All full-time and part-time students must submit immunization records. Failure to comply may result in a hold being placed on your registration (<http://www.northwestern.edu/healthservice-evanston/new-incoming-students/entrance-health-requirements/index.html>).

## Accessibility

Northwestern University is committed to providing the most accessible learning environment as possible for students with disabilities. Should you anticipate or experience disability-related barriers in the academic setting, please contact AccessibleNU to move forward with the university's established accommodation process (e: [accessiblenu@northwestern.edu](mailto:accessiblenu@northwestern.edu); p: 847-467-5530). If you already have established accommodations with AccessibleNU, please notify your instructor as soon as possible, preferably within the first two weeks of the term. Disability information, including academic accommodations, is confidential under the Family Educational Rights and Privacy Act.

## Academic Calendar

The University's Academic Calendar is available online and outlines important dates and deadlines. [https://planitpurple.northwestern.edu/calendar/academic\\_calendar/](https://planitpurple.northwestern.edu/calendar/academic_calendar/)

## Northwestern Monday

Though winter and spring quarters begin on a Tuesday, the Monday class schedule will be in effect of the first day of the quarter, a practice referred to as "Northwestern Monday." Classes that usually meet only on Tuesdays will not meet during the first week of the term. Students can see the Northwestern Monday schedule under "View My Class Schedule" in CAESAR.

## Academic Standing

To be in good academic standing, a student must meet the quality standards set by the Program and make satisfactory progress toward fulfilling all stated requirements for the degree. A student whose overall grade point average (GPA) is less than 3.0 or who has more than three 'incomplete' grades or who fails to complete the degree requirements within 5 years of matriculation is not meeting academic standards set forth by the Program in Public Health.

A student with a GPA of less than 3.0 or who has more than three incomplete grades may be placed on probation. A student who fails to resume good academic standing after being placed on probation or who otherwise fails to meet the requirements set by the degree program or TGS may be excluded (dismissed) from The Graduate School.

## Academic Integrity

Every Northwestern faculty member and student belongs to a community of scholars where academic integrity is a fundamental commitment. The Program in Public Health abides by the standards of academic conduct, procedures, and sanctions as set forth by The Graduate School at Northwestern University. Students and faculty are responsible for understanding the information provided by The Graduate School on their Web page at <https://www.tgs.northwestern.edu/academic-policies-procedures/policies/academic-integrity.html>.

Academic misconduct includes, but is not limited to

- a. Receiving or giving unauthorized aid on examinations or homework
- b. Plagiarism
- c. Fabrication
- d. Falsification or manipulation of academic records
- e. Aiding or abetting any of the above

Faculty reserve the right to use the 'TurnItIn' function that is part of the Canvas Course Management System to evaluate student assignments. Information about this tool can be found at

<https://canvaspost.northwestern.edu/2014/09/29/turnitin-for-canvas/>.

## Withdrawals and Refunds

Students who wish to withdraw from the university must inform the [PPH Administrator and the Associate Director of Admissions and Graduate Affairs](#) and email TGS Student Services immediately ([gradservices@northwestern.edu](mailto:gradservices@northwestern.edu)). International graduate students should also contact the International Office.

The amount of tuition refunded depends on when during the quarter the withdrawal request is made. View the refund schedule (<http://www.northwestern.edu/sfs/payments/withdrawing-from-the-university/withdrawal-calculator.html>) to determine how much tuition will be refunded based on what percentage of the quarter has elapsed.

## Grievances and Conflict Resolution

Graduate students sometimes experience important disagreements and problems regarding program policies and/or their professional relationships with faculty. Should the student wish to seek assistance and/or state a grievance regarding such a problem, the student should consult first with his or her academic advisor.

If the issue involves the advisor, the student should seek assistance at the next level up:

<i>Dr. Kwang-Youn Kim</i> <i>MS Program Director</i> <i>(Level 1)</i>	<i>Dr. Ron Ackermann</i> <i>PPH Program Director</i> <i>(Level 2)</i>	<i>Dr. Neil Jordan</i> <i>CEHS Director</i> <i>(Level 3)</i>
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The student is encouraged to take the grievance first to the lowest level of the hierarchy and then, if necessary, move up from one level to the next.

At the same time, students should know that one of the main responsibilities of the Center for Education in Health Sciences Director is to monitor the progress and work to assure the well-being of all graduate students in the Center, across all Programs. Therefore, students may, in some cases, wish to skip over the first two levels and appeal immediately to the Center for Education in Health Sciences Director if they feel that discussing the problem with faculty in their Program (e.g., advisor, Program Director) is uncomfortable. Finally, the student may wish to talk with a higher administrator in TGS. At the present time, the Associate Dean of Student Services in TGS fills this role.

## Sexual Harassment

It is the policy of Northwestern University that no male or female member of the Northwestern community may sexually harass any other member of the community. Graduate students who wish to learn more about the university's policy or who feel that they may have been sexually harassed should contact the University Sexual Harassment Prevention Office (<http://www.northwestern.edu/sexual-harassment/index.html>). Please note, if a student brings an incident of possible sexual harassment to the attention of a faculty member, the faculty member is obligated to report this to the University Sexual Harassment Prevention Office.

## Graduation

In order to graduate, you must complete an 'Application for Degree' and the 'Master's Completion Form' in **GSTS, (TGS Forms Tab)** (dates are specified at <http://www.tgs.northwestern.edu/academics/academic-services/calendar/index.html>).

When you have successfully completed all final requirements and barring any problems or holds (e.g., X or Y grades, bursar balances), graduation will be approved. You will receive emails notifying you of form submission and final approval.

Specific dates and details are available at <http://www.tgs.northwestern.edu/academics/academic-services/masters/degree/index.html>

### **Graduation Ceremonies**

The Program in Public Health holds two Graduation Celebrations each year, one in May for the MD/MPH graduates and another in June for all other graduates of the PPH programs (including MS in Biostatistics graduates). In addition, graduating students are encouraged to attend the Commencement activities held in Evanston during the third week in June. Information on tickets, caps and gowns, and other pertinent information regarding commencement events in Evanston is posted online at:

<http://www.northwestern.edu/commencement/>.

Approximately 8 weeks after commencement, your diploma will be mailed to the address indicated on the 'Application for Degree'. If your diploma mailing address changes after you submit your 'Application for Degree', please contact [gradservices@northwestern.edu](mailto:gradservices@northwestern.edu) to update your mailing address.