Health Sciences Integrated Program PhD Student Handbook 2024-25

NORTHWESTERN UNIVERSITY

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1. Welcome and Contacts

Welcome to the Health Sciences Integrated Program (HSIP). Northwestern University offers Doctor of Philosophy (PhD) degrees through The Graduate School (TGS). The PhD degree, as distinct from professional doctorate degrees, is primarily oriented toward research that will advance knowledge. HSIP offers doctoral student training across multiple disciplines and the opportunity to focus on a broad array of tracks within the health sciences including biostatistics (BIOSTAT), health and biomedical informatics (HBMI), health services and outcomes research (HSOR), healthcare quality and patient safety (HQPS), and social sciences and health (SSH).

1.1 Program Overview

HSIP is housed within the Center for Education in the Health Sciences (CEHS) at the Institute for Public Health and Medicine (IPHAM) at the Feinberg School of Medicine (FSM). HSIP is an in-person program that requires in-person activity for students to make timely progress towards their degree. HSIP is a collaboration between TGS and FSM. Within FSM, HSIP enjoys active partnerships with IPHAM centers including the Buehler Center for Health Policy and Economics, the Center for Health Information Partnerships, and Center for Health Services and Outcomes Research, and FSM departments such as the Department of Medical Social Sciences and Department of Preventive Medicine, among others. Other clinical and research-based departments provide mentorship and research opportunities.

1.2 Program Contacts

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1.3 Oversight Committee

As an interdisciplinary program, the HSIP Oversight Committee includes the HSIP Director, Associate Director, and each program track's Track Leader. The HSIP Oversight Committee's responsibilities include overseeing the admission process, annual review of student progress, and curriculum changes. The HSIP Oversight Committee is chaired by the HSIP Director.

Director: Lucy Bilaver, PhD, Associate Professor of Pediatrics

Associate Director: Richard Epstein, PhD, MPH, Professor of Psychiatry and Behavioral Sciences

BIOSTAT Track Leader: Lihui Zhao, PhD, Associate Professor of Preventive Medicine

HBMI Track Leader: Theresa Walunas, PhD, Associate Professor of Medicine, Medical Social Sciences, Microbiology-Immunology, and Preventive Medicine

HQPS Track Leader (Interim): Richard Epstein, PhD, MPH, Professor of Psychiatry and Behavioral Sciences

HSOR Track Leader (Interim): Lucy Bilaver, PhD, Associate Professor of Pediatrics

SSH Track Leader: Christine Rini, PhD, Professor of Medical Social Sciences

2. Program Requirements

2.1   Program Curriculum

The program curriculum is designed so that students in all tracks achieve core competencies in ethics, informatics, measurement and outcomes, research design, statistics, and writing and communication. Students are admitted to one of the program tracks. Each track also has track-specific requirements.

Current tracks include:
- Biostatistics (BIOSTAT)
- Health and Biomedical Informatics (HBMI)
- Health Services and Outcomes Research (HSOR)
- Healthcare Quality and Patient Safety (HQPS)
- Social Sciences and Health (SSH)

All students are required to take HSIP 400, the Interdisciplinary Health Sciences Doctoral Colloquium, a one-unit course that convenes during Fall, Winter, and Spring Quarters of students' first year in the program. HSIP 400 is designed to introduce incoming students to each other, the program, the school, and the University, as well as to touch on all core competencies.

In addition to HSIP400, in the first year students are expected to complete track-specific coursework and training to ensure that all competencies are met, though not all tracks require competencies to be met via coursework. Students are also expected to identify a specific research area and faculty member(s) who might serve as their principal research advisor by the end of their second year. HSIP provides a wide range of research opportunities designed to meet the needs of both those students committed to a specific research field when they enter and those who begin with several potential interests that are narrowed down over the course of the first year of study.

Students enter with different prior experiences and subsequent career goals. Thus, the Track Leader, Associate Director, and Director can approve exceptions to required coursework to accommodate individual student needs.

Please note that not all tracks admit students each year and that other (new) tracks may be phased in during subsequent years.

2.2 Track-specific Curriculum

2.2.1 Health and Biomedical Informatics

Informatics is the study of information: how you collect it, how you organize it, and how you use it to solve problems. Health and Biomedical Informatics is informatics applied to healthcare and biomedical research. This track contains many different sub-fields that use similar techniques and tools but apply them to different problem areas.

Required Courses
HSIP 400 Interdisciplinary Health Sciences Doctoral Colloquium (Fall & Winter – 0 credit, Spring – 1 credit)
MHI 403 Introduction to Medical Informatics (Winter – 1 credit)
BIOSTAT 302 Introduction to Biostatistics* (Summer – 1 credit)
HSIP 441 Informatics Methods I or MSCI 330 Introduction to EHR Data for Research (Fall – 1 credit)
HSIP 442 Informatics Methods II (Winter – 1 credit)
HSIP 443 Informatics Methods III (Spring – 1 credit)
HSIP 401 Introduction to Health Measurement Science (Spring – 1 credit)
BIOSTAT 402 Intermediate Biostatistics* (Fall – 1 credit)
HSR 462 Grant Writing ** (Spring – 0.5 credit)
HSR 460 Applied Ethical Issues in Health Services and Outcomes Research (Winter – 0.5 credit)
One Required Healthcare or Biomedical Domain Course
BMD_ENG 304 Quantitative Systems Physiology
IBIS 401 Molecular Biophysics (Spring – 1 credit)
IBIS 402 Molecular Biology of Human Disease (Winter – 1 credit)
IBIS 404 Principles and Methods in Systems Biology (Spring – 1 credit)
IBIS 406 Advanced Topics in Cell Biology (Winter – 1 credit)
IBIS 407 Genetics & Epigenetics (Winter – 1 credit)
IBIS 410 Quantitative Biology (Fall – 1 credit)
DGP 401 Biochemistry (Fall – 1 credit)
DGP 405 Cell Biology (Winter – 1 credit)
DGP 410 Molecular Biology (Winter – 1 credit)
DGP 420 Introduction to Pharmacology (Spring – 1 credit)
DGP 430 Genetics (Spring – 1 credit)
DGP 435 Signal transduction and human diseases (Fall – 1 credit)
DGP 440 Immunology (Winter – 1 credit)
DGP 442 Fundamentals of Microbiology
DGP 450 Tumor Cell Biology (Fall – 1 credit)
DGP 466 Structural Basis of Signal Transduction (Spring – 1 credit)
DGP 475 Virology (Spring – 1 credit)
DGP 485 Data Science for Biomedical Researchers (Spring – 1 credit)

DGP 486 Advance Bioinformatics and Genome Informatics (Winter – 1 credit)
STRT 444 Health Economics (Spring – 1 credit)
MHI 401 American Healthcare System (Fall – 1 credit)
MHI 402 Introduction to Clinical Thinking (Fall – 1 credit)
MHI 404 Health Care Enterprise Operations (Spring – 1 credit)
MHB 403 The History of Medicine and Bioethics (Summer – 1 credit)
MSHA 403-DL American Healthcare, Digital Health and Analytics (Winter – 1 credit)
PUB_HLTH 301 Behavior, Society, & Health (Fall – 1 credit)
PUB_HLTH 412 Infection Disease Epidemiology and Prevention (Summer – 1 credit)
HQS 420 Introduction to US Healthcare System (1 credit)
HSR 433 Health Economics and Healthcare Financing (Fall – 1 credit)
HSR 470 Federal Policy Making and Health Care Reform (Summer – 1 credit)
One Required Computation Course
BIOSTAT 305 Programming for Statistical Analysis (Fall – 1 credit)
MHI 406 Decision Support Systems (Spring – 1 credit)
MHI 405 HIT Standards (Winter – 1 credit)
MSDS 430 Python for Data Science (Fall, Winter, Spring, & Summer – 1 credit)
MLDS 422 Python & Other Data Science Programming (Fall – 1 credit)
MSHA 401 Programming for Health Analytics (Winter – 1 credit)
Three Electives
The three electives are to be in areas where a student will focus their informatics research. Depending on student focus, these courses can include courses on basic sciences (DGP, IBIS) bioengineering (BMD_ENG), healthcare (MHI, HSR, and HQS), and public health (PUB_HLTH). Courses must be approved by the track leader.

* BIOSTAT 302/402 requires students to have a background in calculus and programming experience with the R statistical package. The biostatistics program will make determinations about student readiness. Students without sufficient prior calculus and/or R programming experience should take PUB_HLTH 421 Intermediate Biostatistics, CLIN_PSY 426 Research methods (Statistics) II, or other equivalent approved by the student's advisor.

** The requirement for a grant writing course may also be fulfilled by taking DGP 496-3 Introduction to Life Sciences/Grant Writing in the Summer Quarter for zero credit.

2.2.1.1 *Medical Scientist Training Program/Health and Biomedical Informatics Track*

Students in the Medical Scientist Training Program (MSTP) who are accepted to the Health and Biomedical Informatics (HBMI) track of the HSIP program have an alternative curriculum that accounts for competencies gained during their 1st and 2nd years of medical school. It reduces MSTP students' coursework to the short list of required courses in the table below. Thus, compared with HBMI track students outside of the MSTP program, MSTP students will be waived of the following requirements: MHI 403 Introduction to Medical Informatics, BIOSTAT 302 Introduction to Biostatistics, HSR 462 Grant Writing, one Health Care and Biomedical Knowledge course. Students may request a waiver of the computational requirement based on their academic record prior to medical school. MSTP students do not need to complete any required electives. However, they may choose to take courses that are aligned with their training goals.

Required Courses

HSIP 400 Interdisciplinary Health Sciences Doctoral Colloquium (Fall & Winter – 0 credit, Spring – 1 credit)
HSIP 441 Informatics Methods I or MSCI 330 Introduction to EHR Data for Research (Fall – 1 credit)
HSIP 442 Informatics Methods II (Winter – 1 credit)
HSIP 443 Informatics Methods III (Spring – 1 credit)
HSIP 401 Introduction to Health Measurement Science (Spring – 1 credit)
BIOSTAT 402 Intermediate Biostatistics* (Fall – 1 credit)
HSR 460 Applied Ethical Issues in Health Services and Outcomes Research (Winter – 1 credit)
One Required Computation Course **
BIOSTAT 305 Programming for Statistical Analysis (Fall – 1 credit)
MHI 406 Decision Support Systems (Spring – 1 credit)
MHI 405 HIT Standards (Winter – 1 credit)
MSDS 430 Python for Data Science (Fall, Winter, Spring, & Summer – 1 credit)
MLDS 422 Python & Other Data Science Programming (Fall – 1 credit)
MSHA 401 Programming for Health Analytics (Winter – 1 credit)

*   BIOSTAT 402 requires students to have a background in calculus and programming experience with the R statistical package. The biostatistics program will make determinations about student readiness. Students without sufficient prior calculus and/or R programming experience should take PUB_HLTH 421 Intermediate Biostatistics, CLIN_PSY 426 Research methods (Statistics) II, or other equivalent approved by the student's advisor.

** Students may request a waiver of the computation requirement based on their academic record prior to medical school.

2.2.2   Health Services and Outcomes Research

This track covers a multidisciplinary field of scientific investigation that studies how social factors, financing systems, organizational structures and processes, health technologies, and personal behaviors affect access to health care, the quality and cost of health care, and ultimately our health and well-being. Its research domains are individuals, families, organizations, institutions, communities, and populations.

Required Courses
HSIP 400 Interdisciplinary Health Sciences Doctoral Colloquium (Fall & Winter – 0 credit, Spring – 1 credit)
PUB_HLTH 302 Introduction to Biostatistics (Fall – 1 credit) or BIOSTAT 302 Introduction to Biostatistics* (Summer – 1 credit)
PUB_HLTH 421 Intermediate Biostatistics or BIOSTAT 402 Intermediate Biostatistics* (Fall – 1 credit)
HSIP 401 Introduction to Health Measurement Science (Spring – 1 credit)
HSR 425 Introduction to Quantitative Methods in HSOR (Fall – 1 credit)
HSR 433 Health Economics and Healthcare Financing (Fall – 1 credit)
HSR 456 Applied Qualitative Methods & Analysis for Health Researchers (Summer – 1 credit)
HSR 460 Applied Ethical Issues in Health Services and Outcomes Research (Winter – 0.5 credit)
HSR 462 Grant Writing (Spring – 0.5 credit)
HSR 465 Intermediate Quantitative Methods in HSOR (Winter – 1 credit)
PUB_HLTH 438 Survey Design & Methodology (Spring – 1 credit)
PUB_HLTH 445 Writing and Peer Reviewing for Publication (Fall, Winter, & Spring – 1 credit)

Electives
Students must select _three_ electives in areas in which they will focus their research. These courses typically include courses on healthcare (HSIP, MHI, HSR, and HQS) and public health (PUB_HLTH). Courses must be approved by the track leader.

*   BIOSTAT 302/402 requires students to have a background in calculus and programming experience with the R statistical package. The biostatistics program will make determinations about student readiness. Students without sufficient prior calculus and/or R programming experience should take PUB_HLTH 421 Intermediate Biostatistics, CLIN_PSY 426 Research methods (Statistics) II, or other equivalent approved by the student's advisor.

2.2.3   Healthcare Quality and Patient Safety

Admissions to the HQPS track are on hold until further notice about the status of the MS-HQPS program. Updates to this section of the handbook are therefore deferred.

This track focuses on the knowledge, skills, and methods required for improving healthcare delivery systems in regard to quality and safety. The topics covered include: healthcare quality context and measurement, changing systems of care delivery, healthcare disparities, accountability and public policy, safety interventions and practices, health information technology, simulation and the science of teamwork, human factors, risk assessment methods, and leadership and governance.

Required Courses
HSIP 400 Interdisciplinary Health Sciences Doctoral Colloquium (Fall & Winter – 0 credit, Spring – 1 credit)
HQS 401 Introduction to Healthcare Quality (1 credit)
HQS 402 Introduction to Patient Safety (1 credit)
HQS 420 Introduction to Health Management (1 credit)
HQS 440 Fundamental Methods in Healthcare Quality and Patient Safety (1 credit)
HQS 501 Advanced Healthcare Quality (1 credit)
HQS 502 Advanced Patient Safety (1 credit)
HQS 510 The Business of Quality and Safety Improvement (1 credit)
HSIP 401 Introduction to Health Measurement Science (Spring – 1 credit)
HSR 460 Applied Ethical Issues in Health Services and Outcomes Research (Winter – 0.5 credit)
PUB_HLTH 445 Writing and Peer Reviewing for Publication (Fall, Winter, & Spring – 1 credit)
PUB_HLTH 302 Introduction to Biostatistics (Fall – 1 credit) or BIOSTAT 302 Introduction to Biostatistics* (Summer – 1 credit)
PUB_HLTH 421 Intermediate Biostatistics or BIOSTAT 402 Intermediate Biostatistics* (Fall – 1 credit)
Choose one Research Design:
BIOSTAT 301 Introduction to Epidemiology (Summer – 1 credit)
HSR 425 Introduction to Quantitative Methods in HSOR (Fall – 1 credit)
Other electives (with track leader approval)
Students must select _two_ electives in areas in which they will focus their research. These courses can include courses on basic sciences (DGP, IBIS) bioengineering (BMD_ENG), healthcare (HSIP, MHI, HSR, and HQS), and public health (PUB_HLTH). Courses must be approved by the track leader.

*   BIOSTAT 302/402 requires students to have a background in calculus and programming experience with the R statistical package. The biostatistics program will make determinations about student readiness. Students without sufficient prior calculus and/or R programming experience should take

PUB_HLTH 421 Intermediate Biostatistics, CLIN_PSY 426 Research methods (Statistics) II, or other equivalent approved by the student's advisor.

2.2.4 Social Sciences and Health

The educational mission of this track is to prepare its graduates for scholarly and research careers in outcome and measurement science (e.g., patient centered outcomes), advancing knowledge of determinants of health and disease, intervention science (e.g., to improve quality of life, change health behaviors, and improve the quality of care at the individual and systems levels, and implementation science. Each of these four themes addresses diverse populations and applies a lifespan approach. They also reflect a cross-cutting emphasis on developing novel methods for characterizing and reducing health inequities in vulnerable populations. The overarching goal of this track is to train scientists who are experts in a particular area of person-centered outcomes research and who have the knowledge and skill needed to lead innovative research.

Required Courses
HSIP 400 Interdisciplinary Health Sciences Doctoral Colloquium (Fall & Winter – 0 credit, Spring – 1 credit)
PUB_HLTH 302 Introduction to Biostatistics (Fall – 1 credit) or BIOSTAT 302 Introduction to Biostatistics* (Summer – 1 credit)
PUB_HLTH 421 Intermediate Biostatistics or BIOSTAT 402 Intermediate Biostatistics* (Fall – 1 credit)
BIOSTAT 301 Introduction to Epidemiology (Summer – 1 credit) or HSR 425 Introduction to Quantitative Methods in Health Services and Outcomes (Fall – 1 credit)
HSIP 401 Introduction to Health Measurement Science (Spring – 1 credit)
PUB_HLTH 301 Behavior, Society, and Health (Fall – 1 credit)
HSIP 430 Introduction to Social Sciences and Health (Winter – 1 credit)
PUB_HLTH 445 Writing and Peer Reviewing for Publication (Fall, Winter, & Spring – 1 credit)
HSR 460 Applied Ethical Issues in Health Services and Outcomes Research (Winter – 0.5 credit)
HSR 462 Grant Writing (Spring – 0.5 credit)
Choose one of the following courses:
STAT 348 Applied Multivariate Analysis (1 credit)
ANTHRO 306 Evolution of Life Histories(Spring - 1 credit)
PSYCH 401-2 Psychology Proseminar: Social & Personality Bases of Behavior (Winter – 1 credit)
Electives
Students must select _four_ electives in areas in which they will focus their research. Examples include HSR 456 Applied Qualitative Methods & Analysis for Health Researchers (Summer – 1 credit), PUB_HLTH 323 Health Equity (Fall – 1 credit), PUB_HLTH 438 Survey Design and Method0logy (Spring – 1 credit), and PSYCH 405 Psychometric Theory (Spring – 1 credit). Students' selected electives should reflect their individual goals and needs. Section 2.3 provides further information on electives. Courses must be approved by the track leader.

* BIOSTAT 302/402 requires students to have a background in calculus and programming experience with the R statistical package. The biostatistics program will make determinations about student readiness. Students without sufficient prior calculus and/or R programming experience should take PUB_HLTH 421 Intermediate Biostatistics, CLIN_PSY 426 Research methods (Statistics) II, or other equivalent approved by the student's advisor.

2.2.4.1. Medical Scientist Training Program/Social Science in Health Track

MSTP Students who are accepted to the SSH Track of the HSIP program have an alternative curriculum that accounts for competencies gained during their 1st and 2nd years of medical school. It reduces MSTP students' coursework to the short list of required courses in the table below. Thus, compared with SSH track students outside of the MSTP program, MSTP students will be waived of the following requirements: BIOSTAT 302 Introduction to Biostatistics, HSR 462 Grant Writing, BIOSTAT 301 Introduction to Epidemiology or HSR 425 Introduction to Quantitative Methods in Health Services and Outcomes Research, HSIP 401 Introduction to Health Measurement Science, PUB_HLTH 301 Behavior, Society, and Health, and the required electives. MSTP students do not need to complete any required electives. However, they may choose to take additional courses aligned to their training goals.

Required Courses
HSIP 400 Interdisciplinary Health Sciences Doctoral Colloquium (Fall & Winter – 0 credit, Spring – 1 credit)
HSIP 430 Introduction to Social Sciences and Health (Winter – 1 credit)
HSR 460 Applied Ethical Issues in Health Services and Outcomes Research (Winter – 0.5 credit)
PUB_HLTH 421 or BIOSTAT 402* Intermediate Biostatistics (Fall – 1 credit)
PUB_HLTH 445 Writing and Peer Reviewing for Publication (Fall, Winter, & Spring – 1 credit)

* BIOSTAT 402 requires students to have a background in calculus and programming experience with the R statistical package. The biostatistics program will make determinations about student readiness. Students without sufficient prior calculus and/or R programming experience should take PUB_HLTH 421 or another equivalent course approved by the track leader.

2.2.5 Biostatistics

This track provides students with comprehensive training in the biostatistical methodology and applications, with emphasis on collaboration in biomedical research, including clinical, translational, and basic sciences. The program prepares students for independent research as methodologists and collaborators.

Required Courses
HSIP 400 Interdisciplinary Health Sciences Doctoral Colloquium (Fall & Winter – 0 credit, Spring – 1 credit)
HSR 460 Applied Ethical Issues in Health Services and Outcomes Research (Winter – 0.5 credit)
STAT 420-1 Introduction to Statistical Theory & Methodology 1 (Fall – 1 credit)
STAT 420-2 Introduction to Statistical Theory & Methodology 2 (Winter – 1 credit)
STAT 420-3 Introduction to Statistical Theory & Methodology 3 (Spring – 1 credit)
STAT 350 Regression Analysis or BIOSTAT 402 Intermediate Biostatistics (Fall – 1 credit)
STAT 353 Advanced Regression (1 credit)
STAT 415 Introduction to Machine Learning (Spring – 1 credit)
BIOSTAT 521 Applied Survival Data Analysis (Winter – 1 credit)
BIOSTAT 560 Statistical Consulting (Winter – 1 credit)
HSR 460 Applied Ethical Issues in Health Services and Outcomes Research (Winter – 0.5 credit)
PUB HLTH 445 Writing and Peer Reviewing for Publication (Fall, Winter, & Spring – 1 credit)
Electives
Students must select _three_ electives in areas in which they will focus their research. These courses can include courses on data science (DGP),biostatistics (BIOSTAT), healthcare (MHI, HSIP, HSR, and HQS), public health (PUB_HLTH), and statistics (STAT). Courses must be approved by the track leader.

2.3   General Guidance on Electives

Students may select from graduate level courses at the following Northwestern University Colleges and Schools:
- School of Communication [Visit the School of Communication website.](#)
- School of Education And Social Policy [Visit the School of Education and Social Policy website.](#)
- McCormick School of Engineering And Applied Science [Visit the McCormick website.](#)
- The Graduate School [Visit the Graduate School website.](#)
- Kellogg School of Management [Visit the Kellogg website.](#)
- School of Professional Studies [Visit the School of Professional Studies website.](#)

The course(s) must meet the following criteria:
- It is a graduate level course and is approved for graduate credit by The Graduate School.
- It is NOT a Law School or course in the MD program.
- It is approved by your Academic Advisor.

Please note that policies for cross school registration vary. Please refer to the following link for information: [Cross School Registration: Office of the Registrar - Northwestern University](#)

2.3.1   Course Options through CIC (Committee on Institutional Cooperation) and CME (Chicago Metropolitan Exchange)

Northwestern graduate students may enroll in courses offered at other institutions if recommended by their advisor. The two facilitating programs are the CIC Traveling Scholar Program (funded PhD candidates only) and the Chicago Metropolitan Exchange (all graduate students). Classes taken through the CME and CIC programs may count toward TGS requirements for PhD residency and the minimum requirement of nine graded graduate level courses. Students are allowed to participate in these programs for up to three quarters.

CIC Traveling Scholar Program:
http://www.cic.net/Home/Projects/SharedCourses/TScholar/Introduction.aspx

Chicago Metropolitan Exchange Program:
https://grad.uic.edu/chicago-metropolitan-exchange-program/

2.4   General Timeline to Degree

The ideal timeline for student benchmarks is depicted below. Please note that students enter the program with different combinations of prior educational experiences, work experiences, current research interests, and future career goals. As a result, the general timeline is tailored to individual students as necessary, with two exceptions: qualifying exams must be completed by the end of year three, a dissertation proposal must be successfully completed by the end of year four, and the dissertation must be completed by the end of year nine.

BENCHMARK	YEAR 1				YEAR 2				YEAR 3				YEAR 4 +
	FA	WI	SP	SU	FA	WI	SP	SU	FA	WI	SP	SU	
Advisor	Track Leader							Principal Research Advisor					
Funding	FSM Fellowship							Graduate Research Assistantship *					
Coursework	Complete required and elective coursework												
Research Rotations/Experiences	Rotations/ Experiences vary by track and student within tracks												
Qualifying Exams							Prepare both parts Write 1st part	Write 2nd part					
Dissertation									Propose and defend ASAP. Must propose by end of Year 4. Must defend by end of Year 9.				

* Most students will transition from FSM Fellowship funding to a Graduate Research Assistantship, ideally on a project whose Principal Investigator is a faculty member who has agreed to be the student's Principal Research Advisor, and on a topic related to the student's dissertation research interests. However, funded projects have various beginning and end dates, so this timing may not always work out perfectly. In addition, some students will transition to training or dissertation grants.

2.5   Residency, Waived Courses, and Minimum Course Requirements

HSIP requires its students to complete eight quarters of residency (full-time registration, which consists of 3-4 course units) consecutively over two years, including summers. See Leaves of Absence Section for accepted alterations to this timeline.

TGS requires all graduate students to complete a minimum of 9 graded, graduate level courses. Waived courses may not count towards the 9-course minimum. The HSIP tracks may have additional course requirements (see track-specific curricula). TGS does not provide residency or course credit for graduate level work completed at another accredited institution, other than those taken through CIC or CME. Students may waive out of certain courses by submitting the syllabus and graded transcript showing completion of the course. There is no maximum number of courses that can be waived. The Track Leader reserves the right to waive course requirements and may defer to the Oversight Committee in certain cases.

2.6   Independent Study (HSIP 499) and Research Credit (HSIP 590)

HSIP 499 is the designation for an Independent Study. Independent Study may be requested specifically in a situation where a student requires additional study that is not available through a graded course. To request an Independent Study, please contact the Associate Director to discuss potential course instructors and course content. A form (available on Current Students section of HSIP website) must be completed and signed by the student and instructor and submitted to the Associate Director for review prior to approval. HSIP 499 is a graded course.

For students who have waived out of several required courses but need to meet the minimum residency requirement, up to one-half of courses taken during full-time residency may consist of graded HSIP 499.

HSIP 590 is the designation for Research (either independent or mentored). A student should register for HSIP 590 to indicate time in the term schedule that he/she will spend conducting research for

comprehensive exams, dissertation proposal, and dissertation research and writing. HSIP 590 is graded pass-fail.

For terms during residency during a student's first two years, a student should register for HSIP 590 (1-3 credits) to ensure that full-time enrollment is maintained at 3-4 total course units (graded courses plus research time).

2.7   Registration

Course registration is completed by the student online and starts 6-8 weeks before the beginning of the quarter. Program staff will email a description of the registration procedures to all PhD students shortly before registration opens.

To register for classes, use CAESAR (Computer Assisted Electronic Student Access Route), available at: http://www.registrar.northwestern.edu/

The Registrar's office has a tip sheet, available at: http://ses.northwestern.edu/documentation/SC_Registration_Tip_Sheet_v9.pdf

Should students need to register for courses outside of TGS, they should follow the Cross School Registration instructions for each school, available at: https://www.registrar.northwestern.edu/registration-graduation/registration/cross-school-registration.html

Some courses are housed in the School of Professional Studies (SPS) and incur a $125 Distance Education Fee, which will be paid by the program. Registration requires the following:
- Advisor approval via email.
- Completed Dual Registration Form. The form can be found at the cross-school-registration link above.
- Approval from the appropriate program's Associate Director (AD).

Students should contact the HSIP Program Coordinator for help with logistics and then contact the respective Administrative Director (AD) a week prior to a quarter to see if the class is still open.

2.8   Permission numbers

Permission numbers may be required to register for certain classes. Permission numbers are often distributed on a "first come, first served" basis once registration opens. If the number of interested students exceeds the number of "seats" in the class, students are added to a waiting list.

Permission numbers are time limited. If the student has not used the number to enroll in the course by the Wednesday (at 5pm) prior to the start of the quarter, the number will become inactive. If a student whose permission number expired before he/she enrolled is still interested in taking the course, his/her name will be added to the waiting list.

If a course requires an instructor's permission, the student should email the instructor and obtain written permission (in the form of an email) before asking for a permission number.

As space permits, students on the waiting list will be given permission numbers. Students should contact the Program Coordinator for assistance identifying the AD contact for permission numbers.

2.9   Adding or dropping a class

The last day to drop a class is noted in Registration information for each term at: http://www.registrar.northwestern.edu.

If a student decides to drop a class, they must notify both the instructor and program administration. However, the student must officially drop the class in CAESAR; program staff cannot do this. If a student falls below full-time registration, the student's funding will be affected.

Please note the date for dropping the class in Summer Quarter is much earlier in the quarter than during the rest of the academic year. Students should speak with program staff if they intend to drop a Summer Quarter course.

2.10   Instructional Experience

HSIP students are required to fulfill the TGS requirements that all PhD students serve in some instructional capacity for at least one academic quarter during their graduate education at Northwestern. The HSIP administrative team will inform students when they are aware of opportunities, with an aim to find Teaching Assistant (TA) positions in a course relevant to the student's area of expertise. The TA experience will allow for direct contact with and contribution to the assessment and evaluation of students. Whenever possible the TA will be given an opportunity to assist in course planning, possibly through a discussion or lab section. TGS and the Searle Center for Advancing Learning and Teaching periodically offer additional opportunities for pedagogical instruction. Students can find more information about their current offerings by visiting the TGS (https://www.tgs.northwestern.edu) and Searle Center (https://www.northwestern.edu/searle/) websites and by talking with the HSIP Director and Associate Director who may have information about current offerings.

Students must record TA experiences in the Graduate School Tracking System (GSTS) which includes a teaching field that asks students to describe their role, the terms in which they taught, the course name, and the course number.

Most TA or teaching opportunities available to HSIP students come with additional pay and are subject to the TGS policy about work for additional pay. Please see Section 4.3 Working below for the criteria.

2.11   Monitoring Progress toward the PhD

Students are encouraged to meet with their Academic Advisor/Dissertation Committee Chair quarterly but must meet with their Academic Advisor/Dissertation Committee Chair once per year, usually late Spring or early Summer quarter, for the Annual Review of Student Progress, which is documented in GSTS. Students initiate the process by completing their self-review in GSTS prior to the meeting with their Academic Advisor or Dissertation Committee Chair. Progress Reports are due by June 15. Student self-evaluation and Academic Advisor/Dissertation Committee Chair reviews are reviewed by the Track Leader. Any concerns will be discussed by the Oversight Committee during the summer quarter. An email will be sent to PhD students and their advisors indicating that their progress has been reviewed and, where appropriate, noting any recommendations regarding the adequacy of the progress, particularly of academic milestones.

The annual review of student progress is intended/viewed as a means of supporting PhD students in their effort to graduate in a timely manner and achieve the other milestones needed to be successful in their chosen career paths. The annual review can help identify, at earlier points in their program, students who may need attention regarding their progress toward their career goals.

2.12   Academic Advisor

HSIP students' first year Academic Advisor is assigned by the HSIP Oversight Committee. The first year Academic Advisor is typically the Track Leader. Students are responsible for scheduling and planning meetings with their Academic Advisor and for meeting milestones defined by this handbook. Academic Advisors and students confer prior to the beginning of each quarter to discuss course registration, teaching assistantship opportunities, and other academic matters. Student course selection must be approved by the Academic Advisor and documented accordingly. Students are encouraged to meet with their advisor at least quarterly to discuss ongoing progress and formulate plans for acceptable academic progress. The Track Leader (if they are not the Academic Advisor), Associate Director, and Director are also available for advising. The Academic Advisor serves as the primary advisor until a Principal Research Advisor is identified. Request for a change in Academic Advisor should be submitted to the Associate Director. Requests will be discussed with the student and advisor separately, and a final decision will be approved by the Director.

2.13   Dissertation Chair and Committee

For the dissertation stage of the PhD, each student enrolled in a PhD program at Northwestern must have a Principal Research Advisor and a committee. The Principal Research Advisor is typically the student's Dissertation Chair.

The Dissertation Chair (also known as primary research mentor, dissertation director, or advisor) is a member of the Northwestern University Graduate Faculty who works with the student to develop a research topic, formulate ideas and structure for, and guides the progress of the dissertation. In some cases, although rare, there is a Dissertation Co-Chair (principal research co-advisor) who also works with the student to develop a research topic, formulate ideas and structure for, and guides the progress of the dissertation.

The Dissertation Chair should be identified during the first or second year with the aim of having identified the Dissertation Chair by the end of year 2. The Dissertation Chair will serve as the primary mentor for the development, research, and writing of the dissertation project.

Request for a change in Dissertation Chair should be submitted to the HSIP Director. Requests will be discussed with the student and Chair separately, and a final decision will be approved by the HSIP Oversight Committee.

The student, in consultation with his/her Dissertation Chair, will identify the other members of the Dissertation Committee. The Committee members are those who have expertise in and inform the student's area of research, serve as a reader of the thesis, prospectus, or dissertation, and vote on the outcome of the proposal defense/final exam. A minimum of three individuals, including the Dissertation Chair, must serve on the final exam committee. At least two members of this committee, including the Chair, must be members of the Northwestern University Graduate Faculty. The student will notify the HSIP Coordinator **by email** for approval by the HSIP Director and Track Leader. Requests for a change in

membership either from the student or a faculty member should be submitted in writing to the HSIP Director. Changes will be approved by the HSIP Oversight Committee.

2.14 Timeline of PhD Advising and Monitoring of Progress

After accepting an of offer of admission: • HSIP Coordinator emails regarding assigned Academic Advisor. For most students, the initial Academic Advisor, is the Track Leader.   • Student corresponds with Academic Advisor prior to first term regarding course selection for Year 1 and potential research interests for future.   • Please note this happens relatively quickly after accepting an offer of admission, particularly for HQPS track students who matriculate during Summer quarter.
Year 1

Fall
 • Student meets with Academic Advisor to discuss:
     o course planning
     o research interests
     o potential research assistantships or lab rotations
 • Student should complete PhD Program Plan form with Academic Advisor and enter information into GSTS.

Winter
 • Student meets with Academic Advisor to discuss:
     o Year 2 funding
     o course planning
     o research interests
     o potential research assistantships or lab rotations
 • Student should revise and resubmit PhD Program Plan form as needed.

Spring
 • Student meets with Academic Advisor to:
     o Complete the annual review of student progress
     o Update PhD Program Plan
     o course planning
     o Year 2 funding
     o teaching experience plans/opportunities

Summer
 • Students continue full-time enrollment to meet 2-year continuous residency requirement.
 • Student meets with Academic Advisor to discuss:
     o qualifying exam planning
     o Year 2 funding
     o teaching experience plans/opportunities
 • Student should revise and resubmit PhD Program Plan form as needed.

Year 2
Fall   • Student submits qualifying exam form and begins writing the first part of the qualifying exam once approved   • Student meets with Academic Advisor to discuss:

- o   review status of funding
- o   teaching experience plans/opportunities
- o   begin planning for dissertation
- o   outstanding coursework
- Student should revise and resubmit PhD Program Plan form as needed.

Winter
- Student continues writing the first part of the qualifying exam
- Student meets with Academic Advisor to discuss:
  - o   review status of funding
  - o   teaching experience plans/opportunities
  - o   planning for dissertation (aim to identify the Principal Research Advisor if not already done, and if possible, meet with the student to review the dissertation topic, committee, and proposal defense)
- Student should revise and resubmit PhD Program Plan form as needed.

Spring
- Once Principal Research Advisor has been identified, meet with the student to review the dissertation topic, committee, and proposal defense.
- Student meets with Principal Research Advisor (or Academic Advisor, if Principal Research Advisor has not been identified) to complete the Annual Review of Student Progress, update the PhD Program Plan as needed, and discuss course selection if required.
- If not already done, return the signed Principal Research Advisor form to the HSIP director.
-

Summer
- Write the second part of qualifying exam
- Student continues full-time course enrollment to meet 2-year continuous residency requirement.
- Once Principal Research Advisor has been identified, meet with the student to review the dissertation topic, committee, and proposal defense. Revise and resubmit PhD Program Plan form as needed.
- If not already done, return the signed Principal Research Advisor form to the HSIP director.
- Overview Committee will provide feedback on annual progress.

Year 3 [a]

Fall
- Student meets regularly with Principal Research Advisor to plan dissertation proposal process and select and invite Dissertation Committee.
- Revise and resubmit PhD Program Plan form as needed.

Winter
- Student continues to meet regularly with Principal Research Advisor.
- Revise and resubmit PhD Program Plan form as needed.

Spring
- Student works with Principal Research Advisor to complete Annual Review of Student Progress and update PhD Program Plan
- Student defends dissertation proposal and incorporates feedback and revises as necessary, with assistance from Principal Research Advisor.

Summer
- Student continues to meet regularly with Principal Research Advisor.
- Overview Committee will provide feedback on annual progress.

Year 4 and beyond [a]
Fall
• Student continues to meet regularly with Principal Research Advisor.
Winter
• Student continues to meet regularly with Principal Research Advisor.
Spring
• Student works with Principal Research Advisor to complete Annual Review of Student Progress and update PhD Program Plan
• Meets with Principal Research Advisor to plan dissertation defense.
• Dissertation defense feedback is incorporated and dissertation is revised as necessary.
Summer
• Student continues to meet regularly with Principal Research Advisor.
• Overview Committee will provide feedback on annual progress.
[a] Students must enroll in HSIP 590 to maintain full-time status.

3. The PhD Program

3.1   First Year of Study

3.1.1   Interdisciplinary Health Sciences Doctoral Colloquium (HSIP 400)

This course is a year-long colloquium designed as an overview of foundational issues in each of the disciplines that comprise the interdisciplinary health sciences doctoral program. The series enables participants to explore theories and methodologies that comprise each discipline and apply them as appropriate to their own developing research. This course meets for one and a half hours, roughly every other week for the first three quarters of the first year of study. The course is in-person with a hybrid option to accommodate unforeseen circumstances.

3.1.2   Core Competencies

All HSIP students must achieve proficiency in the core competency areas. Each student's individual plan to achieve these competencies should be part of the discussion between students and Academic Advisors during program planning discussions. This flexible approach is necessary to meet student needs because students enter the program with diverse prior educational and research experiences, meaning that students are allowed to meet competencies in different ways.

- Ethics. All students in all tracks are required to take HSIP 460 Applied Ethics Issues in Health Services and Outcomes Research.

- Informatics. Students in the HBMI track demonstrate this competency through successful completion of the required informatics sequence HSIP 441, 442, and 443 (or the equivalent). Students from all other tracks develop a plan with their Academic Advisor during program planning about how to achieve this competency.

- Measurement and Outcomes. HSOR, HQPS, and SSH track students usually demonstrate this competency by successfully completing HSIP 401 Introduction to Health Measurement Science.

BIOSTAT and HBMI track students develop a plan with their Academic Advisor during program planning about how to achieve this competency.

- Research Design. All students in all tracks will develop a plan with their Academic Advisor during program planning about how to achieve this competency. HSOR, HQPS, and SSH track students often meet this competency by successfully completing HSR 425 Introduction to Quantitative Methods in Health Services and Outcomes Research. BIOSTAT track students often achieve this competency by successfully completing BIOSTAT 560 Statistical Consulting. HBMI track students often achieve this competency by successfully completing the required informatics sequence HSIP 441, 442, and 443 (or the equivalent). Students develop individual plans during program planning.

- Statistics. HBMI, HSOR, HQPS, and SSH track students achieve this competency by successfully completing coursework in intermediate biostatistics such as BIOSTAT 402 Intermediate Biostatistics or PUB_HLTH 421 Intermediate Biostatistics. BIOSTAT track students achieve this competency by successfully completing STAT 350 Regression Analysis. Students develop individual plans during program planning.

- Writing and Communication. Most students achieve this competency by taking DGP 496-3 Introduction to Life Sciences / Grant writing, HSR 462 Grant writing, or PUB_HLTH 445 Writing and Peer Reviewing for Publication. Students develop individual plans during program planning.

3.1.3   Additional coursework as required by each track

Please refer to section 2.2 Track-specific Curriculum for additional course requirements that should be completed during years 1-3 as agreed with your Academic Advisor.

3.1.4   Training in Human Subjects Research Protections and Responsible Conduct of Research

Training in Human Subjects Research Protections. All students, staff, and faculty are required to complete training in the protection of human subjects in research if they are going to participate in IRB-approved research. To meet this requirement, HSIP students must complete the NU IRB-required CITI human subjects research training modules. Because HSIP students must complete these training modules before engaging in research and are expected to engage in research as soon as possible after matriculating, HSIP students are required to complete the NU-required training during their first quarter and maintain compliance throughout their time in the program. Some students will enter the program having already completed this training at another institution and will need to update their CITI profile to include their NU affiliation. Documentation of completion should be uploaded to GSTS.

Training in Responsible Conduct of Research. In addition to training in human subject research protections described in the section above, NU requires all PhD students to complete training in the Responsible Conduct of Research (RCR). To meet this requirement, HSIP students matriculating in Fall Quarter 2023 or later must complete register for and complete HSR 460 Applied Ethical Issues in Health Services and Outcomes Research, a 0.5 credit course that has been confirmed by Northwestern's Office of Research Integrity as an approved RCR training course, and which is typically offered during Winter Quarter.

Students who matriculated prior to Fall Quarter 2023 should refer to the RCR section of the handbook in place at the time they matriculated and consult with the Associate Director and Director to confirm their RCR requirements.

Students who have not graduated before what would be their sixth year in the program will need to have their RCR training refreshed.

3.2 Second and Third Years of Study

3.2.1 Additional coursework as required by each track

Please refer to section 2.2 Track-specific Curriculum for required and additional course requirements that should be completed during years 1-3 as agreed with your Academic Advisor.

3.2.2 Registration after eighth quarter

After eight quarters, students have three registration options:
1. Continue to register for graded courses, if required.
2. If receiving stipend funding, register for 3 credits of HSIP 590.
3. If not receiving stipend funding, register for TGS 512 This is full time registration and continues until graduation if the student remains at Northwestern.

Per the continuous registration policy, all doctoral students must be registered at Northwestern University in each of the fall, winter, spring, and summer terms until all degree requirements have been completed, including dissertation submission to The Graduate School. Full-time registration is required for use of University facilities, access to the Student Health Service, and insurance coverage. Any alterations in the residency timeline can be managed through Leave of Absence requests.

TGS registration policies and timeline can be found at:
https://www.tgs.northwestern.edu/about/policies/general-registration-policies.html

3.2.3 Qualifying Exams

The HSIP qualifying exam has two-parts. Part 1 is "track specific." The goal of the track specific part is to demonstrate knowledge, understanding, and proficiency in track-related content and methods. Part 2 is "integrated." The goal of the integrated part is to demonstrate breadth of knowledge and an ability to integrate information from two or more health sciences disciplines.

Students are expected to work independently on both parts of the exam. Exceptions include working with the track leader during the preparation period, asking the Exam Committee clarifying questions after the exam period begins and, for exams that involve literature reviews, assistance from Galter Library librarians. Students can use all relevant materials, including previously submitted grant proposals, if the student does not copy and paste from those documents (i.e. any ideas from grant proposals must be put into the student's own words). Funded grant proposals must be treated as any other source material and cited appropriately. Students wishing to cite unfunded or unsubmitted grant proposals should consult their Exam Committee about how to use and/or cite.

In general, students in all tracks will begin the qualifying exam at the same time. Students will prepare for the exam in the Fall Quarter of their 2nd year, begin work on the track-specific part during Fall Quarter of their 2nd year, complete the track-specific part of the exam by the end of the Winter Quarter of their 2nd year, and write the integrated part of the exam in the Summer Quarter of the 2nd year.

Different tracks have different assignments for each part of the exam. Biostatistics Track students complete a knowledge test and data analysis for the track specific part and an applied data analysis for the integrated part, Health and Biomedical Informatics Track students complete the required sequence of methods courses for the track specific part and a mock grant proposal for the integrated part. Healthcare Quality and Patient Safety Track students complete a case study for the track specific part and a narrative review of existing literature for the integrated part. Health Services and Outcomes Research and Social Sciences and Health Track students complete a systematized review of the existing literature for the track specific part and a mock grant proposal for the integrated part.

Summary information is provided below. Detailed information is in the Appendix A.

General Structure of exam
- Students will complete a qualifying exam worksheet and share / discuss it with the Track Leader during the preparation period. The qualifying exam worksheet cover details about the proposed topics (if applicable) and submitting the worksheet initiates dialog with the Track Leader about potential exam topics. Please see the Current Students section of the website for exam planning worksheet.
- The Track Leader will select the Exam Committee. Topics will be selected by the Exam Committee.
- Exam period:

Track	Track Specific		Integrated	
	Type	Duration	Type	Duration
BIOSTAT	In-class test; Take-home data analysis	6 hours; 4 days	Applied data analysis	12 weeks
HBMI	Grades in HBMI methods sequence	Not applicable	Mock grant	4 weeks
HSOR	Systematized review of existing literature	8 weeks	Mock grant	4 weeks
HQPS	Case study	12 weeks	Narrative review of existing literature	12 weeks
SSH	Systematized review of existing literature	8 weeks	Mock grant	4 weeks

- Most parts of these exams require presentations. See Appendix A for details. Because the track specific part of the HBMI exam results in a grade, no presentation or "defense" is required. For the track specific and integrated parts of the BIOSTAT, HSOR, SSH, and HQPS exam, and the integrated part of the HBMI exam, a presentation or "defense" is required.

Timing
- Students are expected to begin their **track specific qualifying exam in Fall quarter of their 2nd year**. There are two exceptions to this rule. The first is the HBMI track where students

complete their qualifying exam when they successfully complete methodological coursework in their 1st year with a grade of A- or higher. The second is the BIOSTAT track where students begin the in-class portion of the track-specific qualifying exam in early September.

- Students are expected to begin their **integrated qualifying exam in Summer quarter of their 2nd year.**
- TGS deadline for successfully passing qualifying exams and entering candidacy is the end of the student's 3rd year in the program. Before entering candidacy is students must complete all required and elective coursework as detailed in the track-specific curriculum section 2.2. Failure to complete exams by this deadline will result in a report of inadequate progress toward degree and probation. (This will compromise funding status until resolved).
- A visual overview of the structure and timing of the HSIP qualifying exam is depicted in the following table. Exceptions to the timeline can be approved by the track leader.

Activity	Year 2				Year 3
	FA	WI	SP	SU	FA
Prepare the qualifying exam worksheet *	X		X		
Begin the track-specific part of the exam	X	X			
Complete the track-specific part of the exam		X			
Presentation of exam (if applicable)			X		
Begin the integrated part of the exam				X	
Complete the integrated part of the exam				X	
Presentation of exam (if applicable)					X
* Because they will only be submitting the integrated portion of the worksheet, HBMI track students will submit the worksheet in the Spring Quarter of Year 2.					

The Exam Committee

- The exam committee will objectively evaluate the student's qualifications to enter PhD candidacy.
- The exam committee will include three or more faculty members. It will be chaired by the Track Leader, include the HSIP Director or Associate Director, and at least one additional faculty member chosen by the Track Leader and HSIP Director or Associate Director. If the any above specified faculty members are the Principal Research Advisor for the student, another faculty member will be selected to chair or participate on the committee.
  - o Part 1: Track specific. BIOSTAT, HSOR, HQPS, and SSH track students will have a Committee, as described above, and include an oral defense. HBMI track students do not require a Committee for their track specific exam because grades are determined by the faculty member(s) writing the exam(s).
  - o Part 2: Integrated. For all tracks, the Committee for the Integrated part of the Qualifying Exam will have three members, with one from student's track, one from a related track, and either the HSIP Director or Associate Director. The related track faculty member will be chosen by the committee Chair and represent the secondary discipline identified by the student for the integrated part of the exam.
  - o The committee chair is usually the track leader. The committee chair will oversee communicating the committee's decisions and feedback with the student and the HSIP Program Coordinator.

Grading

- Committees will assign a grade of Pass, Conditional Pass, or Fail. HBMI and BIOSTAT track specific exams do not have committees that assign grades; thus, these track specific exams are subject to grades given by the relevant faculty member(s).
- A grade of *Pass* means no additional work is required and indicates that the student has written and defended an exam that meets the criteria described in each track-specific Appendix, mastered sufficient skills in research design, scientific writing, and public speaking such that further examination is not required, and demonstrated sufficient knowledge in both the narrow and broad fields of their research.
- A grade of *Conditional Pass* is assigned when the examining committee feels a student has deficiencies that can be corrected by the student within a *short period of time* (typically 4 weeks or less). Such deficiencies may lie within the written and/or oral sections of the exam. The committee may request resubmission of the written proposal, reexamination with an oral defense, or both. The committee will communicate to the student, through the exam chairperson, a set of clear instructions for correcting the identified problems. A time limit for completion of the corrections will be provided. Students are encouraged to talk with any or all members of the examining committee if there are any questions about the problems to be addressed. As with the first submission and oral defense, the student must work alone in correcting the written document or preparing for a second oral defense. Upon further evaluation, the student may be asked for additional revisions (conditional pass grade remains) or the grade will be changed to either a Pass or a Fail.
- A grade of *Fail* is assigned when the examining committee feels the student did not demonstrate a minimum proficiency in the written document, oral defense (if applicable), or both. This grade implies that the student cannot correct the identified deficiencies without extensive remedial training. By default, a student failing the Qualifying Exam will be subject to dismissal from the HSIP program for failure to maintain adequate progress toward the completion of the degree requirements. The student and their advisor may appeal to the HSIP Oversight Committee for permission to remain in the program and retake the qualifying exam. If the student's advisor is not supportive of the student remaining in his or her lab, then the appeal cannot go forward. The appeal must be submitted within two weeks following the exam decision. If there is no appeal, or if the Program Committee does not grant the appeal, the student will be asked to withdraw from the program. If the student does not withdraw, the HSIP will move to dismiss. If a student's appeal is granted, the student must pass the Qualifying Exam outright on the second attempt. The Exam Committee or track faculty will work with the student to determine a new topic for the exam. Failure of the exam on the second attempt will result in dismissal and no further appeal to HSIP will be allowed.
- In cases in which the three exam committee members do not reach a unanimous decision on Pass or Fail, the committee members will submit their comments to the exam chair, who will then assemble a detailed final report indicating the votes and opinions of the committee members. The final decision on the outcome of the exam will be made by the HSIP Oversight Committee, after reviewing the report from the committee. In such cases, the HSIP will communicate to the student and advisor the decision and will pass on the committee report. Students who are given a Pass without a unanimous exam committee vote will be encouraged, with input from their advisor, to develop a plan to address any deficiencies identified by the committee.

3.2.4   Doctoral Candidacy

Admission to The Graduate School (TGS) does not constitute or guarantee a student's admission to candidacy for the PhD degree. Admission to candidacy is contingent upon the recommendation of the student's department or program and upon approval of the Graduate Faculty.

A student must be admitted to candidacy by the end of the third year of study, which falls on the last day of the 12th quarter. A student failing to meet this milestone will be considered "not in good standing" and, therefore, will be placed on probation. Deadlines may only be altered in the case of medical or family leave, requiring that a petition for deadline extension be submitted to and approved by TGS.

Admission to candidacy is reached by completing all coursework requirements and passing comprehensive qualifying examinations. Information about qualifying exams can be found in the previous section and in Appendix A. At the time of admission to candidacy, proficiency in the major and related fields is certified, and additional requirements for the PhD degree are stipulated.

The PhD Qualifying Exam form must be submitted online via TGS Forms **by the Program Coordinator**. The Program Coordinator must submit for approval of this form before the end of a student's third year. Following the completion of the Qualifying Exam, students will be admitted to candidacy. Students are notified via email by TGS of approval of their Qualifying Exam form and admission to candidacy.

3.2.5   Dissertation Proposal

Following the completion of exams, each student must submit a dissertation proposal and give an oral presentation of their completed and proposed work to their Dissertation Committee. The Committee may require resubmission revisions, which should be resubmitted to the Dissertation Chair for approval. Approval of the dissertation proposal is required for continued progress towards the degree. Per TGS policy, students must have their dissertation proposal approved by the of their fourth year in the PhD program.

A PhD Prospectus form must be submitted **by the student** through TGS forms in GSTS.

Proposal Format
You should propose a focused research question and describe the research plan. Be explicit—do not assume the reader understands your thoughts without a good written explanation. Please use 11-point Arial font, single-spaced, and 0.5" margins. The suggested format is as follows below. Alternative formats may be used if approved by the Dissertation Chair.

Abstract
1/2 page - Describe the problem being addressed (WHAT), its significance (WHY), and your overall approach to achieve your goals (HOW).

Specific Aims
1 page - Describe your hypothesis and the specific goals and approaches you will take to achieve the goals. This section should delineate (usually as numbered statements) what SPECIFIC goals your proposed study will address. The reader should be able to get a clear sense of what you want to do by reading your Specific Aims. This section is often described as the most important section in a research proposal. It is also useful here to tell the reader WHY the study is important to do.

Background, Significance, Innovation and Preliminary Results

4 - 6 pages - Provide sufficient background, in a clear, concise manner, so that the reader will not have to read the existing research literature. Try to envision someone reading the proposal who is not familiar with the subject. Tell the reader what has been accomplished, what has not, and point out what is novel and technically or conceptually innovative. In doing so, set up the context for what needs to be accomplished in your area of interest. Provide supporting evidence (your own preliminary data, if available) that led to the hypotheses and convincing information that suggests the approach is logical and likely to succeed. The preliminary data figures and figure legends must be integrated into the text. The figure legends can be of smaller font than the text of the proposal (10 pt). A PhD dissertation should add new knowledge to the scientific domain. Make sure you articulate what new knowledge will be contributed by your project.

Research Plan

5-20 pages - Describe the research plan to achieve each one of the specific aims. Clearly explain the rationale behind the study activities. This section is usually written to follow, temporally, the individual Specific Aims. Be sure that the study design and analytic approach proposed will unambiguously address the goals outlined in the Specific Aims. In cases where innovative technologies will be used, describe the plan in sufficient detail so that the reader can evaluate it. Identify potential limitations of your study approach and propose alternate strategies to help overcome these limitations. It is very important to present hypotheses of anticipated results and how they will be interpreted. Include a theoretical or conceptual framework that informs your hypotheses and study design. Include a study timeline showing what study tasks will be accomplished each month or quarter. An appropriate rule of thumb is that all the proposed aims should be independent of each other, such that the success of one aim does not rely on the outcome of another.

References

Cite key references for the background and research plan. Include the entire author list of each citation, full titles of papers, year of publication, journal, volume, and inclusive pagination. Original research articles are generally preferred over review papers and textbooks. Use a standard journal style for your field (please note in proposal what style you are using).

If you are proposing to use the article format, then you should also include (in addition to the above):
- Copies of any completed articles (published or not),
- Outline of articles in progress,
- List of proposed journals, and
- Timeline for completion of the work.

In summary, the proposal should be of sufficient length and detail for the Dissertation Committee to be able to assess the plans for the dissertation and comment on its importance to the field and feasibility. The suggested length for the proposal is 12-30 pages.

Special Instructions for Dissertation Grant Awardees

Those students who have been awarded a dissertation grant prior to their proposal and proposal defense should follow the criteria outlined above, incorporating all scientific revisions requested by the funding agency. Students should also include any changes or updates to the approach they've developed since submitting their grant proposal.

Proposal Defense (approx. 2 hours)

The proposal defense can be scheduled by the student when the Dissertation Chair notifies the student that she/he is ready to defend the proposal. The student must send the proposal, via email, to all Dissertation Committee members, HSIP Associate Director, HSIP Director, and HSIP coordinator at least 2 weeks prior to the proposal defense date.

The proposal defense will include an oral presentation to the Dissertation Committee with a question-and-answer period.

- The Committee asks the student to step out of the room for a few minutes while they discuss the status of the dissertation proposal.
- The student presents their proposed project (15-30 minutes), highlighting the background and significance of the project, the purpose of the study questions, hypotheses, the methodology including subject selection criteria, research design, data collection procedures, and data analysis procedures.
- The Dissertation Committee asks the student questions and makes recommendations to the student concerning the topic and methods.
- The Committee asks the student to step out of the room for a few minutes while they discuss the merit of the proposal and required revisions. The committee will also vote whether to approve the proposal, assuming revisions will be made.
- The student is invited back into the meeting to hear the Committee's decision regarding approval and details of necessary revisions, if applicable.
- If required, revisions should be submitted to the Dissertation Chair.
- Once the Dissertation Committee has approved the proposal, the Dissertation Chair must notify the HSIP Coordinator via email. HSIP administration will then approve the PhD Prospectus form online before TGS enters the final approval.

After successful completion of the qualifying exams, to remain in good academic standing, the dissertation proposal (prospectus) must be approved by the Dissertation Committee and submitted through TGS Forms in GSTS **no later than the end of the fourth year of study**.

- Both TGS and HSIP strongly encourage students to meet this requirement sooner, if possible. Doing so allows students to compete for internal and external fellowships in the fall.
- Note also that almost all dissertation projects will necessitate a submission to the Institutional Review Board (IRB).

3.3   Fourth Year of Study and Beyond

3.3.1   Publication

By the end of their PhD program, all students must meet a publication requirement. The requirements vary depending on the student's track and are based on the scientific opportunities expected during a student's doctoral training. Students from the HBMI, HSOR, HQPS, and SSH tracks are required to have at least one first-authored article accepted for publication in a peer-reviewed journal or scientific forum. Students from the BIOSTAT track are required to have at least one first-authored article submitted for publication in a peer-reviewed journal or scientific forum. All students must have their publication certified by their academic advisor or Dissertation Chair prior to submission.

For all students, the paper does not need to stem from the student's dissertation research. Manuscripts can stem from the student's qualifying exam or research experiences completed while in the PhD program. The expectation for publication reflects the need for students to demonstrate their ability to produce scholarly output, at a level consistent with their track's discipline, in order to be competitive in the job market after graduation.

- o   When submitting a manuscript, the student should list affiliations as follows:
    - ▪   If you are a research assistant in a lab, please indicate the lab director's department.
    - ▪   If you are not in a lab, please indicate the home department of your Track Director.
    - ▪   Indicate that you are a PhD student in the Health Sciences Integrated Program at Northwestern University as well as your track.
    - ▪   Include all funding sources in an acknowledgement unless the journal has a specific section for funding sources.

Students are encouraged to consult with the Director or Associate Director with clarifying questions.

3.3.2   Dissertation Project

The exact PhD program duration for an individual student will depend on the time required to complete an original and substantial dissertation of publishable quality. Publishable quality means that the paper would have a reasonable chance of being accepted for publication to an appropriate peer reviewed journal. There are two formats that will be acceptable for completion of an HSIP dissertation. Both formats require an abstract and other elements delineated in the TGS dissertation guidelines (http://www.tgs.northwestern.edu/about/policies/phd-degree-requirements.html#dissertation). Other formats may be appropriate depending on the project; approval from the Dissertation Chair and the HSIP Oversight Committee is required for use of alternative formats.

A.   **Traditional Format**: Generally includes five chapters as follows:
1. **Introduction** should include:
    - Background of previous research in the area and how it informs your proposed dissertation research
    - Thorough review of the literature in your area of dissertation research
    - Purpose of your study
    - Research questions
    - Significance: describe how your dissertation research adds to the field, highlighting novel contributions
    - Innovation: describe any innovative questions, methods, tools or instruments that you will use in your dissertation research

2. **Theoretical basis and conceptual model** for the research

3. **Methods**
    - Describe the complete methods that will be used to conduct your study
    - Describe any tools or instruments that you will use or develop
    - Provide detailed definitions and any necessary development of measures
    - Describe in detail the steps, methods, sources of data, logistics of data collection
    - Provide details of the study sample selection and sample size/power calculation
    - Provide a detailed description of the analytic approach and specific statistical methods that will be applied and why
    - A brief description of the project's IRB status.

4. **Results**: describe the results of your study including appropriate graphs, tables, and depictions

5. **Conclusions**
    - Describe the significance of your results in terms of:
        - o   What you found,

- o What it means to the broader field,
- o What unique contributions your study has made in terms of findings and novel methods, and
- o What next steps or further research would follow your dissertation project? Articulate an agenda for future research on the issues addressed in the dissertation.

6. **Complete bibliography** using the format agreed upon with your Dissertation Chair.

B. **Article Format:** includes the following sections:
   1. **Introduction** including
      - Background of previous research in the area and how it informs your proposed dissertation research
      - Thorough description of the literature in your area of dissertation research that sets the context for your 3 papers
      - Purpose of your study
      - Research questions
      - Significance: describe how your dissertation research adds to the field, highlighting novel contributions
      - Innovation: describe any innovative questions, methods, tools or instruments that you will use in your dissertation research
      - The introduction should provide a narrative that weaves the articles together in a greater body of work. It should describe the articles' collective contribution to the field.
      - Introduction should describe the overall methodology to be used to answer larger research question(s).
      - The length of this section should be determined in consultation with the Dissertation Chair.

   2. **Theoretical basis and conceptual model** for the research (may possibly be included in Section 1)

   3. **The Three Articles**
   - Students need to develop a minimum of three articles, which should comprise a cohesive body of work that supports a theme or themes that are expressed clearly in the introduction of the dissertation.
   - All articles must represent work undertaken during the PhD program.
   - All articles must also connect to the theme or themes of the dissertation.
   - Submission of articles to peer-reviewed journals prior to the dissertation defense may be allowed with the approval of the Dissertation Committee.
      - o If an article has been published before the defense, the student must, as required by US law, obtain copyright permission from the publishing journal to include the article in their dissertation. If there is difficulty acquiring permission, contact the HSIP Director for guidance.
   - At least two (2) of the articles should be based on data that are analyzed by the student.
   - If one article is conceptual in nature, or based on a synthesis of the literature, it must be connected to the theme or themes of the dissertation without relying heavily on the contents of the other articles. The student's Dissertation Committee will determine if the overlap is acceptable or not.
      - o An acceptable amount of overlap includes portions of the literature review, which needs to be cited under mentorship of Committee Chair in various articles because it delineates the entire historical background of the study's focal topic.

- The student must be the first author on all articles. As the first author, the student is responsible for development and articulation of a concept or idea for research, development of the research proposal, development of a research design, conducting research and analysis, writing all major portions of the manuscript, designing an intervention or assessment, and interpreting results. Please see the following references for expectations of a first author.
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3010799/#CIT2
http://www.ncbi.nlm.nih.gov/pubmed/2402047
- Co-authors and order of authorship should be discussed with and approved by the Dissertation Chair.
- If an article is rejected by a journal during the dissertation process, the student may submit it to another journal upon approval by the Dissertation Chair.
- Any changes to the article prior to resubmission must also be approved by the Dissertation Chair and co-authors.
- If an article is rejected by a journal after the successful completion and defense of the dissertation, co-authorship decisions that were made prior to end of dissertation process will no longer be in effect and submission (including changes in authorship or article content) to a new journal will be at the sole discretion of the PhD graduate.
- The Graduate School is developing new rules to allow a student to embargo their dissertation publication (essentially delaying publication in the ProQuest Dissertation Database by one year). Embargoing is beneficial if a journal does not allow other publication of the same results prior to submission of the manuscript.

4. **Conclusion**
   - Summarize the dissertation's major findings, limitations, discussion, and recommendations.
   - Discuss similarities and differences between the three articles.
   - Tie everything together and help the reader see how the articles, taken together, make a contribution to the knowledge base regarding the problem.
   - Discuss research imperatives and knowledge gaps.
   - Articulate an agenda for future research on the issues addressed in the dissertation.

5. **References**
   - Please consult with your Dissertation Chair regarding the most appropriate citation style for articles.

3.3.3   Dissertation Defense

At the conclusion of the research project and, after it has been written to the satisfaction of the Dissertation Chair, a dissertation defense meeting is held with the student, Chair, and other members of the student's Dissertation Committee. The HSIP dissertation defense will also be open to all HSIP faculty, HSIP students, and other persons the defending student would like to invite for support (e.g. family members, students from other programs). The dissertation defense will only be advertised within the HSIP community. The purpose of the meeting is to verify to the Committee's satisfaction that the research and the dissertation or articles adhere to the highest standards of scholarly work.

The student is responsible for scheduling the dissertation defense at a suitable 2-hour time period.

Prior to the defense:

- The student must send the dissertation to all Committee members and HSIP administration at least three weeks prior to dissertation defense.
- All members of the Dissertation Committee will be expected to read the dissertation in advance of the defense, and members must be present at the defense. Video-conference participation may be allowed at the discretion of the Dissertation Chair.

Logistics of the dissertation defense meeting:
- The student should prepare a 15-30 minute presentation that includes: a brief overview of field, theoretical background/conceptual model, the purpose of study, research questions, hypotheses, predictions, methods, results, conclusions, and further directions.
- The public will be allowed to watch the defending student's presentation and will be allowed to ask questions during a brief question and answer period.
- Format and length of the question and answer period will be decided by the Committee in advance of the defense.
- After the question and answer period, the public will be asked to leave the exam room and the private portion of the meeting will commence. The Dissertation Chair and Committee will ask questions and discuss the dissertation.
- After discussion, the Dissertation Chair will ask the defending student to leave the room and the Committee will confer.
- The student will be invited back into the room and the committee will present their evaluation and will inform the student of their passing (and any conditions) or failing.
- Revisions may be required, including expansion of a particular section of the document or additional analyses.
- When revisions are required, the Dissertation Committee will specify the timeframe for submitting revisions, who will review the revisions, and criteria for successful revision.
- The Dissertation Committee members and the student complete, sign, and turn in appropriate TGS forms.

3.3.4   Graduation: Checklist for Doctoral Degree Completion

Required Items:

☐ **Check deadlines for submission of all paperwork listed below.** Deadlines may be found on the webpage https://planitpurple.northwestern.edu/calendar/academic_calendar

☐ **Application for Degree form**: This can be filled out via GSTS. Login to GSTS, click on " "TSG Forms" > "Create New Form" > "Application for Degree"

☐ **PhD Final Exam form (this is for dissertation, not for qualifying exams)**: Login to GSTS to complete and submit the form. Print out a hard copy of the completed form to take to your final dissertation defense. Have each committee member sign the form next to their name. The signed form should go to your DGS (or DGS designate), who will finish the approval process online; the form will be submitted to The Graduate School electronically for final approval, with the signed hard copy to follow.

☐ **Dissertation submission** via ProQuest, http://www.etdadmin.com/cgi-bin/home. Once your dissertation has been approved by your committee and all edits and revisions are complete, submit online via ProQuest. The dissertation must conform to TGS formatting standards: http://www.tgs.northwestern.edu/documents/policies/dissertation-format-guidelines.pdf

Although the guidelines state that an Acknowledgement page is optional, students must include one if dissertation work was supported by an external grant or fellowship, and be sure to acknowledge the funder using the language provided in the Notice of Award.

☐ **Survey of Earned Doctorates** (SED). Take the web survey via https://sed-ncses.org/login.aspx

☐ **The Graduate School PhD Exit Survey**: https://www.tgs.northwestern.edu/academics/commencement/filing-for-graduation.html

☐ If you have any **Y or K grades** on your transcript, your department will need to submit the appropriate change of grade form to The Graduate School by the published deadline.

Additional Reminders:

☐ If you have **student health insurance** through Northwestern University and you would like to cancel it, see the cancellation instructions: https://www.northwestern.edu/student-insurance/insurance-requirements/annual-enrollment-waiver-process/index.html

☐ For information on **commencement and hooding ceremonies** see: https://www.tgs.northwestern.edu/academics/commencement/index.html

☐ The Intent to Participate form is required for students taking part in The Graduate School **Hooding Ceremony** and must be filled out by the deadline: https://www.tgs.northwestern.edu/academics/commencement/index.html

☐ For **regalia** rental/purchase deadlines: https://www.tgs.northwestern.edu/academics/commencement/regalia.html

☐ **Check CAESAR** for holds on your record. Your diploma and copies of your transcript may not be released if you have holds. Contact the Office of Student Accounts with questions: http://www.northwestern.edu/sfs/

If you have questions about the above, or would like to verify what The Graduate School has received to date, please contact your student services representative at gradservices@northwestern.edu or call The Graduate School at 847-491-5279 and ask to speak with a student services representative.

4   Funding and Financial Support

4.1 Funding the PhD

Students are guaranteed stipend, tuition, and fringe benefits (which includes the cost of participating in the student health insurance program) for up to 5 years assuming they are making satisfactory progress towards their degree. Progress will be reviewed and monitored annually by the HSIP Oversight Committee, as described in the section on "Monitoring of Progress Towards the PhD." Students on academic probation may still receive federal or institutional assistance for a limited amount of time (see

section 5.2.6). Funding for a 6th year or beyond is not guaranteed. It is contingent upon satisfactory progress toward the degree and the availability of funds.

The source of funding for students' stipend, tuition, and fringe benefits will vary during students' time in the program. Most students are supported by an FSM Fellowship for their first 6 academic quarters. During those first six academic quarters, students are expected to complete their coursework, develop their research interests, and secure the commitment of a faculty member to serve as their research mentor, and begin preparing for and writing the first part of the qualifying exam. Beginning in quarter 7, most students will be funded as Graduate Research Assistant, ideally by their principal research advisor(s), and/or supported by other internal and/or external sources. More information can be found on The Graduate School's website at:
https://www.tgs.northwestern.edu/funding/about-graduate-funding.html.

Quarters 1-6
Students not receiving funding from an outside source will receive an 18-month FSM Fellowship subject to the policies and procedures outlined in fellowship letters. The fellowship offers a stipend and covers full tuition. The stipend amount is determined each year by the Graduate School and the Feinberg School of Medicine. FSM also determines the number of fellowships HSIP is allowed to offer.

Quarter 7 and beyond
Students not receiving funding from an outside source may receive either a Research Assistantship or Graduate Assistantship for the academic year. An appropriate assistantship on a sponsored project or within a Department will be arranged in conjunction with the HSIP Director and/or Associate Director. Students should begin looking for opportunities during Quarters 3-4. Students must make every effort to secure funding or be prepared to accept funding opportunities provided by HSIP leadership or the student's academic advisor.

Although students are guaranteed funding, that guarantee is contingent on students remaining in good academic standing. It is imperative that students not jeopardize funding by accumulating incompletes or by missing program and Graduate School deadlines.

Data collection and qualitative analysis costs
The Department will support necessary costs of data collection or qualitative data analysis up to $1200 over the course of the student's doctoral training. Necessary costs include those that support the student's dissertation project or qualifying exam. Students needing such support should contact the HSIP Director and/or Associate Director.

Travel and professional development funds
The HSIP encourages students to present at scientific meetings and selectively participate in other professional development activities. Participating in scientific meetings or professional development activities can be expensive. For this reason, students are encouraged to seek funding by following the steps outlined below:

- Step 1: Talk to the faculty member under whose supervision the research is being conducted. Faculty often include the cost of presenting at scientific meetings in sponsored research project budgets and may therefore be able to cover costs associated with meeting attendance.

- Step 2: Apply to the TGS for a Conference Travel Grant (if eligible). The deadline for submitting these applications is prior to the first date of the virtual conference or conference travel, but no

more than 3 months in advance. The maximum amount is $600 per application. Full details, including eligibility requirements, can be found at: Conference Travel Grant: The Graduate School - Northwestern University.

- Step 3: Apply to the HSIP Travel and Professional Development Fund. The HSIP Travel and Professional Development Fund budget is modest, and funds are distributed on a "first come, first served basis." The maximum amount available to any student in a given academic year is $600. Examples of the types of costs for which students can apply to receive reimbursement include the cost of printing an academic poster and paying conference registration fees. Students must submit requests to the HSIP Travel and Professional Development Fund by completing the *Travel Fund Request Form* available on the Current Students section of the website.

4.2 Grants and Fellowships

HSIP encourages eligible students to compete for grants and fellowships, both internal and external. An example of an internal award is the prestigious Presential Fellowship. An example of an external award is the F31 Ruth L. Kirschstein Predoctoral Individual National Research Service Award from the National Institutes of Health (NIH). External awards usually require institutional assurances. Students seeking external awards will be assisted by the IPHAM research administration team. Students should contact the HSIP Director and/or Associate Director several months before an application is due to make sure that all necessary planning is in place and to facilitate the assistance of the IPHAM research administration team, if applicable. This is important because of the need for coordination and communication from the HSIP Director and/or Associate Director and multiple University offices in pre- and post-award management. All student applications must be submitted through IPHAM with the assistance of the IPHAM research administration team.

4.3 Working

Graduate students are expected and considered to be full-time students conducting their studies and research. On occasion another funding opportunity may arise. When that situation occurs, permission to receive additional remuneration must be requested from TGS. PhD students may work no more than 20 hours per week from all sources, including assistantships.

TGS requires that students submit a permission to work form when they are receiving additional pay if any of the following conditions are met:
- The graduate student's service exceeds 10 hours/week **or**
- The graduate student's period of service exceeds one month **or**
- The requested compensation is greater than or equal to $600.

If any of the above conditions are met (including paid teaching assistant positions), the form should be completed, submitted, and approved before the work begins.

For students engaged in work through a Research Assistantship, students will work a maximum of 20 hours per week. The specific number of hours should be agreed upon prior to the start date by the student, PI, and the HSIP Associate Director or Director.

For students funded on a federally funded training or dissertation grant (e.g. T32, R36), please check with the research administrator of the grant to determine how much work above and beyond training activities is permitted.

5   General policies and information

5.1 Master of Science in Health Sciences Degree Option

The HSIP provides a Master of Science in Health Sciences (MSHS) degree option for students who, due to special circumstances, are unable to complete the PhD program. It is appropriate to acknowledge the accomplishments of these students, and the awarding of a master's degree will have a tangible benefit to their future employment and career prospects. To receive the master's degree, students must: Have completed all required coursework with at least a 3.0 cumulative GPA and no X, Y, K, or NR grades on their transcript.

- Have successfully completed both of their HSIP Qualifying Exams.
- Discuss their circumstances and potential master's thesis ideas with their PhD advisor, HSIP track leader, and HSIP Associate Director and Director before submitting a petition.
- Submit a petition by email to the Director of HSIP. The petition must include a brief explanation of why the student does not wish to continue in the PhD program, affirm that the student is in good academic standing, affirm that the student has completed all coursework, affirm that the student has successfully passed both Qualifying Exams, and propose a master's thesis. The master's thesis could be based on the student's qualifying exam, a part of the student's dissertation, or a first-authored manuscript that the student is working on. The email petition should be copied to the PhD advisor, HSIP track leader, and HSIP Associate Director.

A committee comprising these faculty will meet to consider the petition and endorse the master's thesis. If the petition is approved by the committee, then the student will have what remains of the quarter in which the petition is approved plus one quarter to complete the master's thesis. Master's theses must:

- Be submitted to the committee two weeks before being presented to the committee.
- On submission, the master's thesis will receive grades of pass, revise and resubmit, or fail.
- If initial submission is graded revise and resubmit, a revision will be submitted to the committee via email. The committee will review the revision and issue a grade of pass or fail.

Once the master's thesis is approved, a student must work with the HSIP Program Coordinator to ensure that all TGS Forms are submitted in GSTS. Specifically, the student must:

- Complete an "Application for Degree" form via TGS Forms in GSTS and receive program approval of the form by the date specified in the TGS Academic Calendar.
- Complete the "Master's Degree Completion" form via TGS Forms in GSTS and receive program approval of the form by the date specified in the TGS Academic Calendar.

MD-PhD students who choose to leave the PhD portion may petition for the MS in Health Sciences degree as detailed above. They will need to discuss continuation or discontinuation of the other portion of the dual degree with that program's administration.

5.2 Overview of TGS Rules and Policies

Cases of improper academic and/or research conduct, and inappropriate or unprofessional behavior, are considered outside the boundaries of "satisfactory academic progress". These cases are addressed according to the University's existing disciplinary procedures, and may result in a range of sanctions up to and including exclusion from the University. Resources for these cases can be found here:

- TGS Academic Integrity policy
- Office for Research Integrity
- Office of Equity
- Student Handbook

Per federal regulation, recipients of federal financial aid must meet certain requirements (in addition to those listed below) to maintain satisfactory academic progress. Recipients of federal aid should be aware of the Federal Financial Aid Satisfactory Academic Progress Policy.

5.2.1 Criteria for Satisfactory Academic Progress

TGS sets the minimum standard for satisfactory academic progress. Programs may have additional criteria beyond TGS's for determining a student's academic standing. There are three sets of criteria that The Graduate School takes into account in determining whether or not students are making satisfactory academic progress:

- **Program length**. Doctoral students must complete all requirements for the Ph.D. within nine years of initial registration in TGS. TGS's official statement is that "Only rarely under extenuating circumstances will students be granted permission to continue beyond 9 years." Those who are permitted to continue beyond nine years also face a stiff requirement to pay tuition of $1000/quarter. Master's students must complete all requirements for the master's degree within five years of initial registration in TGS. Students who do not complete degree requirements by the established deadlines will not be considered in good academic standing, will not be eligible for financial aid and will be subject to TGS 512 (advanced continuous registration). Students may submit a petition to extend the degree deadline, but those students will not be eligible for financial aid and will be subject to TGS 512.
- **Grades and cumulative GPA**. A student whose overall grade average is below B (3.0 GPA) or who has more than three incomplete (Y or X) grades is not making satisfactory academic progress and will be placed on probation by TGS.
- **Internal milestone deadlines**. Doctoral students who have not been admitted to candidacy by the end of their third year (i.e., passed the qualifying exam), or who have not completed the dissertation prospectus by the end of the fourth year, are not making satisfactory academic progress and will be placed on academic probation by TGS.

Programs may have additional criteria beyond TGS's for determining a student's academic standing. Failure to make satisfactory academic progress, as determined by the program, may be a result of (but is not limited to): unsatisfactory performance in classes, unsatisfactory performance on qualifying exams, unsatisfactory research progress, or failure to meet other program requirements (such as language proficiency or publication requirement). Students earning a grade below B on any required course may be required to retake the course, take another course, or carry out another activity approved by the advisor and program director to demonstrate competency of the course material. Each student's academic progress must be reported annually by the student's program to the student and to TGS.

Failure to make satisfactory academic progress as determined by either TGS or the program will result in probation or exclusion (dismissal).

5.2.2   Additional HSIP Progress Requirements

It is the goal of the HSIP that all students identify a mentor, obtain outstanding research training and complete their PhD requirements in a timely fashion. The Dissertation Committee's primary duty is to review the student's research progress and provide both scientific and personal advice and support. Nevertheless, it is also the Committee's responsibility to evaluate the student's work and to report to the HSIP whether the student is making appropriate progress towards completion of the PhD. Students who fail to make adequate progress are subject to dismissal.

Adequate progress by the end of the student's second year in the HSIP program is defined as having identified a Principal Research Advisor. The Principal Research Advisor will agree to mentor the student through completion of the PhD. Faculty agreeing to serve as the Principal Research Advisor will be asked by the HSIP Director to sign a Principal Research Advisor Agreement Form. **Students who fail to secure a Principal Research Advisor by the end of the second year of study may be subject to dismissal.**

Academic Advisors, the Principal Research Advisor, and Committee members are encouraged to openly and honestly communicate to students any perceived difficulties or deficiencies so that the student may address and correct the problems. Likewise, students are encouraged to openly and honestly communicate to their advisors any mentoring difficulties or deficiencies so that the advisor may address and correct the problems. If at any point a student and Principal Research Advisor mutually agree that the student would be better served in another research team, the student will be permitted to find another dissertation research home. The decision should be communicated to the HSIP Director. HSIP leadership will aid the student as much as possible in finding a new research home. The student must secure a new research home within three months or be subject to possible dismissal from the HSIP.

In cases where a student fails to make adequate progress or engages in disruptive behavior, the procedures below are to be followed.

5.2.3 Failure to make adequate academic progress

It is the Dissertation Committee's responsibility to evaluate a student's work and to report to HSIP leadership whether or not the student is making appropriate progress towards completion of the PhD. In a case where the Committee determines that a student is not making adequate progress appropriate for the stage of their graduate career, the Committee will complete an evaluation report that indicates the specific deficiencies. Following a Dissertation Committee meeting report that indicates a lack of progress toward completion of the degree, the Dissertation Chair will inform HSIP leadership in writing of the problem and submit copies of other supporting documentation. Such documentation might include, but would not be limited to, written communication with the student outlining the problem areas, email correspondence between the Dissertation Chair and the student, notes of private or team meetings at which the student was informed of problems with their work, or any other such materials that notify the student of problems in their performance and progress.

If such documentation does not exist, at this time the Dissertation Chair should notify the student and the HSIP in writing of any problems in their performance and progress. The Dissertation Chair will meet

with the student's Dissertation Committee in the absence of the student to formulate a plan for improvement. This plan will be communicated to the student in writing and should include the scheduling of another Committee meeting within three to six months. The student may meet with the Committee members in the absence of the Dissertation Chair to learn firsthand the expectations of the Committee. Importantly, such a meeting allows the student to articulate their view of the problems, some of which may be due to the Dissertation Chair.

If at the next full meeting (within six months) the Committee determines that the student has failed to make adequate progress, the Committee will complete an evaluation report indicating the failure. The advisor will notify the HSIP Director of his/her intent to dismiss the student from their research team. The HSIP Director will make sure the appropriate documentation is in place and procedures have been followed. The Dissertation Chair can then elect to dismiss the student from the team without further obligation. The HSIP Director will advise the student on his/her options. A student who is dismissed from a team for academic reasons may petition the HSIP Oversight Committee for permission to seek a new dissertation research home.

Where appropriate, the Oversight Committee may allow a student one month to find a new Dissertation Chair. Failure to secure a new research home in that time frame will result in dismissal from HSIP. The TGS policy on adequate academic progress and dismissal (exclusion) can be found at: https://www.tgs.northwestern.edu/academic-policies-procedures/policies/satisfactory-academic-progress.html

5.2.4 Disruptive Behavior

As stated in the *Compact between Biomedical Graduate Students and Their Research Advisors*, students are expected to maintain a high level of professionalism, self-motivation, engagement, scientific curiosity, safety and ethical standards. In all cases, HSIP students are subject to the code of conduct detailed in the Northwestern University Student Handbook. Any faculty, students and staff who observe behavior that disrupts the university community may notify the HSIP administration and/or TGS in confidence. The HSIP will refer these cases to appropriate University officials. As outlined in the Northwestern University Student Handbook, consequences may include dismissal from the University.

If a student is perceived to act in a manner that disrupts normal research team function, the advisor or should notify the student and the HSIP office in writing of the problem behavior and request a meeting of the student, advisor, and HSIP representative(s) in order to identify ways to potentially remedy the problem. If appropriate, support staff from another University office(s) can also be included in this meeting. If, after this meeting, the student does not correct the behavior in a timely manner, the Academic Advisor or Principal Research Advisor will notify the HSIP Director in writing of the details of the continuing problems and submit a petition for permission to dismiss the student from the lab.

The HSIP Director will meet with the student, the advisor, and any relevant parties to make a final determination on dismissal. A student who is dismissed from a research team for behavioral reasons may petition the HSIP Oversight Committee for permission to seek a new research home. When appropriate, the Oversight Committee may allow a student one month to find a new research home and dissertation advisor. Failure to secure a new research home in that time frame will result in dismissal from the HSIP.

5.2.5 Petitioning for Extension

Students who have exceeded their time to degree deadline or a milestone deadline for the qualifying exam or prospectus may petition TGS for an extension. The petition for an extension must contain the following information:

- The specific length of the extension: Please list the exact date by which the requirement will be met. The extension time frame should be realistic.
- A detailed rationale for the extension
- A detailed timeline for meeting the new deadline: What work remains to be completed and what is the specific timeline, with proposed deadlines, by which that work will be completed within the extension period?
- A detailed letter of support for the extension from the HSIP Director
- A detailed letter of support for the extension from the student's Academic Advisor or Principal Research Advisor

5.2.6 Probation

A student who is not making satisfactory academic progress due to one of the reasons outlined above will be placed on academic probation by The Graduate School or HSIP.

When a decision to place a student on probation is made by The Graduate School, the student will be notified in writing, along with the HSIP Director, and will be given at most two quarters (not including summer quarter) to resume satisfactory academic standing. The Graduate School notifies students of probation status on a quarterly basis.

During the probationary period, students will remain eligible to receive federal and institutional assistance (except when they have exceeded their degree deadline). At the end of the probationary period, progress will be reviewed. If a student cannot re-establish satisfactory academic standing during the two probationary quarters, the student will become ineligible to receive financial aid and will be excluded (dismissed) from TGS.

When a decision to place a student on probation is made by the program, the student and The Graduate School must be notified in writing.

5.2.7 Exclusion (Dismissal)

The University defines exclusion in the Student Handbook.

A student who fails to resume satisfactory academic standing after at most two quarters (excluding summers) after being notified of placement on probation by The Graduate School will be excluded from The Graduate School.

Under certain circumstances, a student can be excluded by a program without first being placed on probation. This may occur only if:

- the criteria for exclusion have been stated clearly by the program and have been disseminated to the students effectively, and
- both the Director of Graduate Study and either the Chair of the graduate program's student advisory committee or the Chair of the student's department approve the exclusion.

Funding will cease on the effective date of the exclusion unless other arrangements are made.

5.2.8 Notification of Exclusion (Dismissal)

When TGS determines that a student is to be excluded, both HSIP and the student will be informed in writing (e-mail communication is considered to be "in writing") within five business days of the determination.

Similarly, when a decision to exclude a student is made by HSIP, both the student and TGS must be informed in writing within five business days of the decision.

The exclusion (dismissal) notification must include the effective date of the exclusion and a clear statement of the reason(s) for exclusion.

5.2.9 Appeal Process

Students wishing to appeal a program's exclusion decision may appeal the final program exclusion decision to The Graduate School. To appeal a program decision, students should submit a request in writing to the attention of the Director of Student Services within ten days of the date of the program's final written determination of exclusion to the student and include any supporting materials at that time. If no appeal is filed within the ten-day appeal period, the program's decision becomes final and not subject to appeal.

Exclusion appeals are reviewed by the Dean of The Graduate School (or his designate) who may request additional information from, or a meeting with, the student and/or program before making a final decision. The Dean's decision will be made within 30 days of the submission and will be communicated in writing to both the student and the program. When resolution cannot be achieved within 30 days, students and programs will be informed in writing of the delay and the final disposition will be achieved as quickly as possible.

The Dean's decision is final in both program and Graduate School exclusions proceedings with the exception of academic dishonesty/misconduct findings where the student has 10 days to appeal the Graduate School Dean's decision to the Provost.

5.3 Grievances

The Graduate School realizes that conflicts emerge occasionally, and they have devised the following guidelines for students for the chain of communication when dealing with different types of conflicts.

5.3.1 Conflicts not involving discrimination, harassment, or sexual harassment

When a conflict arises, whether with a student's Academic Advisor, Principal Research Advisor, a fellow student, or someone else in the University, TGS recommends that students first talk to their DGS

(Director of Graduate Studies)**.** One function of the DGS is to address student concerns and grievances and to be available when students are experiencing academic difficulty.

If the DGS has a conflict of interest, the Chair of the student's department is the next resource. In the case that a student cannot or does not want to speak with anyone in the program or department, the next resource is The Graduate School. In TGS, the Associate Dean for Graduate Student and Postdoctoral Affairs, Gayle E. Woloschak, PhD, handles student conflict issues and works directly with the academic school Associate Deans and faculty, as needed.

DGSs, department chairs, TGS staff, and TGS Deans can treat students' concerns confidentially unless the concerns involve sexual harassment, discrimination, or a safety issue, in which case they are obligated to report the issue to the appropriate University office.

5.3.2 Discrimination and Harassment

The University's nondiscrimination policy is as follows:

Northwestern University prohibits discrimination on the basis of actual or perceived race, color, religion, creed, national origin, ethnicity, caste, sex, pregnancy, sexual orientation, gender identity, gender expression, parental status, marital status, age, disability, citizenship status, veteran status, genetic information, reproductive health decision making, height, weight, or any other class of individuals protected from discrimination under federal, state, or local law, regulation, or ordinance or any other classification protected by law in the matters of admissions, employment, housing or services or in the educational programs or activities it operates, as required by Title IX of the Education Amendments of 1972; Title III of the Americans with Disabilities Act of 1990, as amended in 2008; Section 504 of the Rehabilitation Act of 1973; Title VI and VII of the Civil Rights Act of 1964; the Age Discrimination Act of 1975; the Age Discrimination in Employment Act of 1967; and any other federal, state, or local laws, regulations, or ordinances that prohibit discrimination, harassment, and/or retaliation.

The University has designated the Associate Vice President for Civil Rights and Title IX Compliance to coordinate the University's compliance with federal and state civil rights laws regarding protected characteristics, including Title IX and those other laws and regulations references above:

Emily Babb
Associate Vice President for Civil Rights and Title IX Compliance | Title IX Coordinator
Office of Civil Rights and Title IX Compliance
1800 Sherman Ave., Suite 4500
Evanston, IL 60201
(847) 467-6165
OCR@northwestern.edu

Tiffany Little
Senior Director. Civil Rights and Title IX Compliance | Deputy Title IX Coordinator
Office of Civil Rights and Title IX Compliance
1800 Sherman Ave., Suite 4500
Evanston, IL 60201

(847) 467-6165
OCR@northwestern.edu

The University complies with all federal and state laws that protect individuals with disabilities from discrimination based on their disability or perceived disability status. As such, reasonable accommodations and auxiliary aids and services are available to individuals with disabilities when such modifications and services are necessary to access the institution's programs and services. The University's ADA/504 Coordinator is:

Laura Conway
Director, ADA Compliance | ADA Coordinator
Office of Civil Rights and Title IX Compliance
1800 Sherman Ave., Suite 4500
Evanston, IL 60201
(847) 467-6165
Accommodations@northwestern.edu

Sam Milgrom
Deputy ADA Coordinator
Office of Civil Rights and Title IX Compliance
1800 Sherman Ave., Suite 4500
Evanston, IL 60201
(847) 467-6165
Accommodations@northwestern.edu

Inquiries about Title IX or the University's prohibitions against discrimination, harassment, and retaliation can be directed to the Associate Vice President for Civil Rights and Title IX Compliance, the ADA/504 Coordinator (for disability-related questions) or to the U.S. Department of Education Office for Civil Rights at the contact information listed below:

Complaints and inquiries regarding discrimination, harassment, and retaliation involving federal laws may be directed to:

U.S. Department of Education
Office for Civil Rights
John C. Kluczynski Federal Building
230 S. Dearborn St., 37th Floor
Chicago, IL 60604
(312) 730-1560
OCR.Chicago@ed.gov

U.S. Equal Employment Opportunity Commission
John C. Kluczynski Federal Building
230 S. Dearborn St., Suite 1866
Chicago, IL 60604
(312) 872-9777

Any person who believes that the University as a federal contractor has violated nondiscrimination or equal opportunity obligations may contact the Office of Federal Contract Compliance Programs (OFCCP) at

OFCCP
U.S. Department of Labor
200 Constitution Ave. NW
Washington, D.C. 20210
www.dol.gov
(800) 397-6251

5.3.3 Sexual Harassment

It is the policy of Northwestern University that no member of the Northwestern community - students, faculty, administrators, staff, vendors, contractors, or third parties - may sexually harass any other member of the community. For information or assistance regarding a sexual harassment complaint, please see the University's Sexual Harassment Policy.

The university's Title IX statement is as follows:

It is the policy of Northwestern University to comply with Title IX of the Education Amendments of 1972, which prohibits discrimination (including sexual harassment and sexual violence) based on sex in the University's educational programs and activities. Title IX also prohibits retaliation for asserting or otherwise participating in claims of sex discrimination.

The Title IX coordinator and the deputy coordinators (listed under Our Staff) have been designated to oversee Northwestern's compliance with Title IX and to respond to reports of violations. For more information about Title IX, go to Northwestern's Title IX website. A person may also file a complaint with the Department of Education's Office for Civil Rights regarding an alleged violation of Title IX by visiting the U.S. Department of Education's website or calling 800-421-3481.

5.3.4 Additional Resources

Counseling and Psychological Services (CAPS)
CAPS staff are available on both the Evanston and Chicago campuses. CAPS promises confidentiality unless there is a safety concern (see https://www.northwestern.edu/counseling/)

Office of Student Conduct and Conflict Resolution for conflicts between students.

Ethicspoint can be used to report ethics violations, or violations of Northwestern policy.

5.3.5 Graduate Expectations Document

The Graduate Education Expectations Document has been ratified by The Graduate School, the Administrative Board, the Graduate Faculty, and the Graduate Leadership Council (GLC) as a guide for

student-advisor relations. This best practices document is intended to be posted on all TGS academic program websites to inform students who experience conflicts of the procedures to follow to get these encounters resolved.

Since 2008, the GLC Annual Survey has found an increasing number of students experiencing student-advisor conflicts, which may be due in part to lack of communicated expectations. TGS and the GLC are confident that this document will help students and advisors create positive relationships that guide departments toward achieving academic success.

5.4 Professional Development and Work-in-Progress Seminars

Students are expected to stay current on advances in their field and to participate in the general academic life of the program and their track. This includes, but is not necessarily limited to, attending relevant departmental seminars. This is required for students in all years of the program. Each track will identify additional expected activities. These may change over time.

Conference, training and publication opportunities outside and within Northwestern will be collected through continuous monitoring by the administrative team and summarized on the program's listserv. Additionally, some of the collaborating departments and institutes have seminar series, such as the IPHAM Thursday Seminar Series (every Thursday during the academic year from 12-1pm).

All HSIP students are expected to attend regularly scheduled professional development seminars and work-in-progress meetings organized by the HSIP student organization and administrative team. These meetings typically occur on the days when HSIP 400 does NOT meet. The meetings will occur throughout the academic year and include:

- Professional development seminars on a wide range of topics
- Work-in-progress seminars, which provides HSIP students with an opportunity to present their research to their student colleagues for feedback. Work-in-progress seminars can be used for presenting research at any state, from getting feedback on specific aims & study design ideas to presenting a completed study. Students may also rehearse job talks or conference presentations at the work-in-progress seminar. Work-in-progress seminars are typically designated as formal (with faculty participation) or in-formal (without faculty participation).

Absences should be reported to the HSIP Coordinator.

5.5 University and Community Service

HSIP students are encouraged to seek out service opportunities. The best source of information on such opportunities is the weekly TGS Wire. This is an excellent source for service and other volunteer opportunities. While university, community and professional service are not HSIP requirements, having some of these experiences while you are a PhD student may make you a stronger candidate for the TGS Presidential Fellowship and when you go on the fellowship or job market.

5.6 Academic Integrity

Academic integrity at Northwestern is based on a respect for individual achievement that lies at the heart of academic culture. Every faculty member and student, both graduate and undergraduate, belongs to a community of scholars where academic integrity is a fundamental commitment. Adherence to scholastic honesty and ethical conduct applies throughout all academic undertakings. Maintaining an environment of integrity and instilling in students a lifelong commitment to good scholarship is one of the most important goals of The Graduate School at Northwestern.

5.7 Academic Calendars

Students may access Academic Calendars online:
http://www.registrar.northwestern.edu/calendars/index.html

5.8 WildCARD

WildCARD is the Northwestern University identification card. This card serves as your University ID card and your library card (and offers a variety of other features) . You should get a WildCARD as soon as possible after you register for your first class.

To review other benefits offered by WildCARD, visit: http://www.univsvcs.northwestern.edu/WildCard. The WildCARD office on the Chicago campus is located in Abbott Hall, Room 100, 710 N. Lake Shore Drive. Office hours are 8:30 a.m. to 5:00 p.m. Monday through Friday.

5.9 Health and Dental Insurance

Check information with TGS (http://www.tgs.northwestern.edu/graduate-life/health-services/health-plan/index.html).

For students starting summer term, you must contact the health insurance office at phone (312) 503-1242 and ask for a form to be sent to you. You must submit a signed form to the office.

For students starting fall term, **new entering Full-Time graduate students** must complete the online "Coverage Selection Form" (CSF) through CAESAR (www.northwestern.edu/caesar) and must be completed by the deadline (see website). Students who miss the deadline will automatically be enrolled in the University's health insurance plan. Billing for the university's health insurance plan will take place upon completion of registration. Once billed the program will pay 100% of the fee.

5.10   Student and Family Leave

A student who needs to take a leave from the university (general leave, medical leave, family leave, or childbirth accommodation) must request an official leave of absence. Students use the "Petition for Absence" form via "TGS Forms" in CAESAR to apply for a leave of absence, citing why leave is necessary. The form is reviewed by both the program and The Graduate School.
- No leave is granted for less than one quarter or more than one calendar year.
- If a student requests renewal of a leave of absence beyond one year, the student's record will be reviewed to determine whether an extension of the leave will be approved.

- Any student who is granted a leave of absence must register for TGS 512 Continuous Registration for each Fall, Winter and Spring Quarter the student is absent. All international students must consult with the International Office before applying for leave of absence.

A graduate student will, on request, be given a one-quarter leave of absence to give birth, to care for the newborn or mother, or to or adopt a child. Prior to the end of the one quarter the student may request a one-quarter extension. Deadlines for candidacy and degree completion will be extended by the length of the leave.

- Any student who is granted a family leave must register for TGS 512 Continuous Registration for each quarter the student is absent.
- Those students wishing to request accommodations provided by the Childbirth
- Accommodation Policy must specifically indicate when filing out the Petition for Absence that they wish to make use of the Childbirth Accommodation Policy.

International students must adhere to additional U.S. government requirements. Under SEVIS regulations, the mother may take medical leave authorized by a physician. Leaves for international students also must be authorized through the International Office.

TGS provides a variety of child and family resources. More information can be found at
https://www.tgs.northwestern.edu/services-support/family-resources/child-family-resources.html

5.11 NetID and Email

Your **NetID** is your electronic identity at Northwestern. Many systems and records are defined as services associated with your NetID, including:
· E-mail
· Online University directory
· NU Library online resources
· Blackboard and Canvas Course Management Systems
· Access to grades and transcripts
· Access to the Electronic Time Entry System (ETES)
· Access to the campus wireless network
· Off-campus access to the NU network

Most NetIDs have access to all these services, but some are restricted by school affiliation or the purpose of the NetID. To get your NetID, you must be in the University database (which means a NetID has been assigned to you). New students are entered into the database by the University Registrar. You must **activate your NetID** before you can use it. You will be notified when your NetID has been created and you can begin this process. Students will receive their NetID Activation Code from their school or the Admissions Office.

Email
The HSIP uses e-mail as their primary means of communication with students. Students must use their NetID to access a course's Canvas site, and/or evaluation system. If you prefer to use a personal email account, you still need to activate your NetID and NU e-mail account, but you can choose to have your NU e-mail messages forwarded to your personal account. It is very important that your NetID and e-mail account are kept active so that you can receive pertinent information about the Program throughout your academic career at NU.

Student email addresses (u.northwestern.edu) are not secure for PHI or PII. Please use @northwestern.edu addresses if you are involved with research, patient, student or other secure data. More details about Feinberg IT policy can be found at: Policy Compliance: Feinberg Information Technology: Feinberg School of Medicine (northwestern.edu).

5.12   Parking and Transportation

Parking: Please refer to the website for more information: http://www.northwestern.edu/uservices/transportation/parking/permits/index.html

Intercampus Shuttles
Northwestern University also has an intercampus shuttle system which links the Evanston and Chicago campuses. Though most of your classes will be on the Chicago campus, it is definitely worth it to take a trip to the beautiful and lush Evanston campus. There are also TGS events and workshops that will be available to you in Evanston.

The intercampus shuttle leaves from in front of the Ward Memorial Building (303 E. Chicago Avenue Chicago). You will need to show your WildCARD to board the shuttle. For schedules and the routes of other campus shuttles, go to
http://www.northwestern.edu/uservices/transportation/shuttles/index.html

Train Station Shuttles
Please refer to the website for more information:
http://www.northwestern.edu/uservices/transportation/shuttles/chicago/trainstation.html

Appendix A: Qualifying Exam Descriptions

A.1. Health Services and Outcomes Research

A.1.1 Track Specific Exam

The student will develop a **systematized review**, as described on the Galter Library website, on an HSOR topic **related to the student's research interests**. The paper should be planned, developed, and formatted for an HSR-specific journal, such as *Medical Care Research and Review*. The systematized review should follow PRISMA guidelines, with several exceptions: 1) students are not required to register a protocol and 2) students are not required to use a second screener of titles and abstracts or full text. If, after this part of the exam is complete, students would like to do the additional work required to turn the systematized review into a systematic review, then the student is welcome to do so.

Using the qualifying exam planning worksheet, the student will submit 2 possible topics for the systematized review to the committee chair. The committee chair will identify committee members and together the committee will choose the final topic.

Students will begin the exam in **Fall Quarter of their 2nd year** and be given **8 weeks** to complete the systematized review. Students are encouraged to meet with Galter Library research librarian to plan their search strategy prior to submitting the planning form.

Failure to submit the review by the deadline will result in a grade of "Fail." Students needing an extension should request one (including justification) as early as possible.

Oral Presentation of the written document (20 minutes by the student). The student should schedule a 90-minute meeting with the exam committee. The student presentation should generally follow the outline of the written document.

Evaluation of Performance

To earn a grade of "Pass," the systematized review should be of high quality, and ready or nearly ready (i.e., only a few minor edits needed) for submission to a peer-review journal.

Criteria for Grading the Written Examination

The committee will critically assess the review in terms of the:

- Contribution to knowledge, theory, policy, or practice;
- Approach/methods;
- Finding, in particular, how they are presented and interpreted;
- Conclusions and implications; and
- Writing quality, clarity, and style, and the organization of the information presented.

Criteria for Grading the Oral Examination

- Is the student able to engage in a positive scientific discussion with the committee?
- Is the student able to verbally express sophisticated scientific concepts?
- Is the student able to answer questions about the literature that demonstrate that they understand the critical issues in the domain?

A.1.2 Integrated Exam

The student will prepare a **mock grant proposal** that draws on knowledge **across multiple tracks**. The topic can be related to**, but not identical** to the student's dissertation. Students are expected to prepare a one-page Specific Aims and a six-page Research Strategy. The Research Strategy should follow the formatting of an R21 or R03 NIH proposal (i.e. significance, innovation, and approach) and be expected to reflect 2 years of work. The specific format and considerations for each section are as follows:

Specific Aims

The Specific Aims page should succinctly describe the general area of study, the main question(s) addressed, the rationale behind the choice of this qualitative or empirical approach, the approach, and the significance of the study. If appropriate, this page will also indicate the hypothesis and specific aims of the proposal.

Research Strategy

Organize the **Research Strategy** in the specified order and using the instructions provided below. Start each section with the appropriate section heading – Significance, Innovation, Approach. Use citations (where appropriate) in the Research Strategy section and provide the full reference in the Bibliography and References Cited section.

THE RESEARCH STRATEGY SHOULD BE A MAXIMUM OF 6 PAGES. (not counting references)

Background and Significance

- Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.
- Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.
- Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

Innovation

- Explain how the application challenges and seeks to shift current research or clinical practice paradigms.
- Describe any novel theoretical concepts, approaches or methodologies, instrumentation or interventions to be developed or used, and any advantage over existing methodologies, instrumentation, or interventions.
- Explain any refinements, improvements, or new applications of theoretical concepts, approaches or methodologies, instrumentation, or interventions.

Approach

- Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project.
- Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.
- Include a timeline for the proposed study.

If the proposal has multiple Specific Aims, then the Research Strategy may address Significance, Innovation and Approach for each Specific Aim individually, or may address Significance, Innovation and Approach for all of the Specific Aims collectively.

REFERENCES. In addition to the 6 pages for the primary grant document, the student has an unlimited number of pages in which to provide the references that support their proposal. To ensure in-depth knowledge in the proposed field of research, *students are expected to read and understand the most important papers in the field of interest as a necessary antecedent to developing their proposal. These papers and any other reference information supporting the statements in the Background and Significance, Innovation, or Approach section should be supplied as references to the proposal.*

Although the proposal will focus on HSOR topics**, it must include at least** <u>one aim</u> **that addresses a major topic from one other HSIP Track**, such as Healthcare Quality, Social Sciences and Health, Health and Biomedical Informatics or Biostatistics.

The question addressed should be distinct from the student's proposed dissertation work. It must also be distinct from the work of others in the lab and must not be a component of any of the lab's current work or work described in a written proposal or discussed as part of the lab's future directions. The proposed work should be well grounded in the published literature and not based on preliminary data generated by the student or in the student's lab.

The proposal must be the work of the student. Naturally, many ideas contained in a proposal may have been formulated during interactions between the student and the advisor or other scientists, both from within and outside the lab. As a natural part of a student's lab experience, the scope, aims, and experimental approaches for a project may have been discussed. The student alone, however, must come up with the topic suggestions and write the proposal. Neither the faculty advisor nor any other individual (e.g., students, post-doctoral fellows) should provide input on the suggested topics or edit the proposal prior to its submission. The student will affirm the originality of the document by placing the following passage on the cover page of their proposal:

"The work in this proposal represents the original work of (insert student's name), who received only general help in regard to the proposed aims and the overall preparation of the proposal."

A student will receive a grade of FAIL if it is determined that he or she did not follow these rules and obtained substantial help. Students with knowledge of such cheating should report violations to the HSIP Director or Associate Director.

Using the **qualifying exam planning worksheet**, the student will submit 2 possible topics for the mock grant proposal to the committee chair. The committee chair will identify committee members and together the committee will choose the final topic.

Students will begin the exam in **Summer quarter of their 2nd year** and be given **4 weeks** to complete the mock grant proposal. Failure to submit the review by the deadline will result in a grade of "Fail." Students needing an extension should request one (including justification) as early as possible.

Oral Presentation of the written document (20 minutes by the student). The student should schedule a 90-minute meeting with the exam committee. The student presentation should generally follow the outline of the written document.

Questions during the oral exam can be comprehensive in nature to allow the committee to ascertain whether the student has mastered the knowledge base required to conduct the proposed experiments and to understand the background and significance of the proposal. No outside help on preparing the presentation or preparing for potential questioning is permitted.

Evaluation of Performance

Proposals will be evaluated based on significance, innovation, technical merit of the approach including quality of the analysis plan, and quality and clarity of the written work. To earn a grade of "Pass," the proposal should be of high quality, and ready or nearly ready (i.e., only a few minor edits needed) for submission to a funding body and reflect the student's potential to propose independent research. The exam committee will provide detailed and direct feedback to the student. The evaluation will address the criteria below.

Criteria for Grading the Written Examination

- **General**
    - Are the proposed aims of the project independent, feasible, properly controlled, and of reasonable scope?
    - Does at least one aim relate to the selected secondary track?
- **Background and Significance**
    - Is the background concise and relevant to the proposal?
      Is the relevant literature reviewed and critically evaluated and are primary references (as opposed to review articles) cited where appropriate?
      Is the proposed project technically and/or conceptually innovative?
    - Does the review reflect the current state of knowledge in sufficient detail?
    - Does it clearly identify the gap in knowledge that motivates the proposal?
- **Innovation and Approach**
    - Is there a clearly stated and acceptable hypothesis, if appropriate?
    - Do the proposed empirical approaches adequately test the hypothesis?
    - Does each qualitative or empirical approaches have a rationale?
    - Are the proposed approaches feasible, properly controlled, and of reasonable scope?
    - Are the approaches descried in sufficient detail to demonstrate adequate mastery of the research area?
    - Does the proposal predict all potential outcomes of the approach and are alternative approaches proposed when necessary?
- **Written Communication Skills**
    - Is the proposal clearly written and carefully edited, and does it comply with the conventions of proposal writing?

Criteria for Grading the Oral Examination

- **Oral Communication Skills**
    - Is the student able to engage in a positive scientific discussion with the committee? Is the student able to verbally express sophisticated scientific concepts?
    - Is the student able to answer questions about the proposal that demonstrate that they understand the critical issues in the domain?

A.2. Health & Biomedical Informatics

A.2.1 Track Specific Exam

Since the HBMI track curriculum includes a year-long integrated course series, the homework, projects and examinations in the courses will serve as the evaluation of core informatics concepts. The examinations in the methods course series will be cumulative, and students are expected to demonstrate the ability to apply informatics concepts and integrate information across the quarters. Students who achieve an A- or higher on all three quarters of the informatics methods course will be considered to have fulfilled this requirement. Students who achieve a B+ or lower in any of the quarters may, at the discretion of the HBMI faculty, be required to complete an additional examination or project to demonstrate competency in the relevant areas.

A.2.2 Integrated Exam

The student will prepare a **mock grant proposal** that draws on knowledge across multiple tracks. The topic can be related to**, but not identical** to the student's dissertation. Students are expected to prepare a one-page Specific Aims and a six-page Research Strategy. The Research Strategy should follow the formatting of an R21 or R03 NIH proposal (i.e. significance, innovation, and approach) and be expected to reflect 2 years of work. The specific format and considerations for each section are as follows:

<u>Specific Aims</u>

The Specific Aims page should succinctly describe the general area of study, the main question(s) addressed, the rationale behind the choice of this qualitative or empirical approach, the approach, and the significance of the study. If appropriate, this page will also indicate the hypothesis and specific aims of the proposal.

<u>Research Strategy</u>

Organize the **Research Strategy** in the specified order and using the instructions provided below. Start each section with the appropriate section heading – Significance, Innovation, Approach. Use citations (where appropriate) in the Research Strategy section and provide the full reference in the Bibliography and References Cited section.

THE RESEARCH STRATEGY SHOULD BE A MAXIMUM OF 6 PAGES. (not counting references)

Background and Significance

- Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.

- Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.
- Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

Innovation

- Explain how the application challenges and seeks to shift current research or clinical practice paradigms.
- Describe any novel theoretical concepts, approaches or methodologies, instrumentation or interventions to be developed or used, and any advantage over existing methodologies, instrumentation, or interventions.
- Explain any refinements, improvements, or new applications of theoretical concepts, approaches or methodologies, instrumentation, or interventions.

Approach

- Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project.
- Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.
- Include a timeline for the proposed study.

If the proposal has multiple Specific Aims, then the Research Strategy may address Significance, Innovation and Approach for each Specific Aim individually, or may address Significance, Innovation and Approach for all of the Specific Aims collectively.

REFERENCES. In addition to the 6 pages for the primary grant document, the student has an unlimited number of pages in which to provide the references that support their proposal. To ensure in-depth knowledge in the proposed field of research, *students are expected to read and understand the most important papers in the field of interest as a necessary antecedent to developing their proposal. These papers and any other reference information supporting the statements in the Background and Significance, Innovation, or Approach section should be supplied as references to the proposal.*

Although the proposal will focus on HBMI topics**, it must include at least <u>one aim</u> that addresses a major topic from one other HSIP Track**, such as Healthcare Quality, Social Sciences and Health, Health Services and Outcomes Research or Biostatistics.

The proposed work should do more than apply informatics knowledge or methods to a stated problem. The student must propose a study that advances the *science of informatics.* Successful informatics integrated exams tend to have a common structure.

1. The proposal identifies an important question within health care (the domain need).
2. The proposal identifies that current tools/methods for the question have the following weakness/limitation/bias (the informatics need).
3. The proposal seeks to improve the tools or methods by changing or creating new informatics applications.
4. The proposal seeks to demonstrate that the new tool or method is better than the old tool or method.

The question addressed should be distinct from the student's proposed dissertation work. It must also be distinct from the work of others in the lab and must not be a component of any of the lab's current work or work described in a written proposal or discussed as part of the lab's future directions. The proposed work should be well grounded in the published literature and not based on preliminary data generated by the student or in the student's lab.

The proposal must be the work of the student. Naturally, many ideas contained in a proposal may have been formulated during interactions between the student and the advisor or other scientists, both from within and outside the lab. As a natural part of a student's lab experience, the scope, aims, and experimental approaches for a project may have been discussed. The student alone, however, must come up with the topic suggestions and write the proposal. Neither the faculty advisor nor any other individual (e.g., students, post-doctoral fellows) should provide input on the suggested topics or edit the proposal prior to its submission. The student will affirm the originality of the document by placing the following passage on the cover page of their proposal:

"The work in this proposal represents the original work of (insert student's name), who received only general help in regard to the proposed aims and the overall preparation of the proposal."

A student will receive a grade of FAIL if it is determined that he or she did not follow these rules and obtained substantial help. Students with knowledge of such cheating should report violations to the HSIP Director or Associate Director.

Using the **qualifying exam planning worksheet**, the student will submit 2 possible topics for the mock grant proposal to the committee chair. The committee chair will identify committee members and together the committee will choose the final topic.

Students will begin the exam in **Summer quarter of their 2nd year** and be given **4 weeks** to complete the mock grant proposal. Failure to submit the review by the deadline will result in a grade of "Fail." Students needing an extension should request one (including justification) as early as possible.

Oral Presentation of the written document (20 minutes by the student). The student should schedule a 90-minute meeting with the exam committee. The student presentation should generally follow the outline of the written document.

Questions during the oral exam can be comprehensive in nature to allow the committee to ascertain whether the student has mastered the knowledge base required to conduct the proposed experiments and to understand the background and significance of the proposal. No outside help on preparing the presentation or preparing for potential questioning is permitted.

Evaluation of Performance

Proposals will be evaluated based on significance, innovation, technical merit of the approach including quality of the analysis plan, and quality and clarity of the written work. To earn a grade of "Pass," the proposal should be of high quality, and ready or nearly ready (i.e., only a few minor edits needed) for submission to a funding body and reflect the student's potential to propose independent research. The exam committee will provide detailed and direct feedback to the student. The evaluation will address the criteria below.

Criteria for Grading the Written Examination

- **General**
  - Are the proposed aims of the project independent, feasible, properly controlled, and of reasonable scope?
  - Does at least one aim relate to the selected secondary track?
- **Background and Significance**
  - Is the background concise and relevant to the proposal?
    Is the relevant literature reviewed and critically evaluated and are primary references (as opposed to review articles) cited where appropriate?
    Is the proposed project technically and/or conceptually innovative?
  - Does the review reflect the current state of knowledge in sufficient detail?
  - Does it clearly identify the gap in knowledge that motivates the proposal?
- **Innovation and Approach**
  - Is there a clearly stated and acceptable hypothesis, if appropriate?
  - Do the proposed empirical approaches adequately test the hypothesis?
  - Does each qualitative or empirical approaches have a rationale?
  - Are the proposed approaches feasible, properly controlled, and of reasonable scope?
  - Are the approaches descried in sufficient detail to demonstrate adequate mastery of the research area?
  - Does the proposal predict all potential outcomes of the approach and are alternative approaches proposed when necessary?
- **Written Communication Skills**
  - Is the proposal clearly written and carefully edited, and does it comply with the conventions of proposal writing?

Criteria for Grading the Oral Examination

- **Oral Communication Skills**
  - Is the student able to engage in a positive scientific discussion with the committee? Is the student able to verbally express sophisticated scientific concepts?
  - Is the student able to answer questions about the proposal that demonstrate that they understand the critical issues in the domain?

A.3. Healthcare Quality and Patient Safety

A.3.1 Track Specific Exam: Quality/Safety Case Study

It is anticipated that this component of the Qualifying Exam will take approximately **12 weeks** to complete.

Purpose
Describe/understand the full dynamics of a major institutional quality or safety program of improvement through the development of a case study. In developing the case study, the candidate will

need to provide a description and critique of each of the steps involved in how the organization identified, assessed, and sought to address the quality or safety gap.

Choosing a Topic
The candidate will be asked to review a quality or safety program of improvement activity and related decisions and outcomes that was viewed as an important event for the associated health care organization. However, for the quality program or safety initiative to be accepted for a case study, the candidate will need to make a convincing justification of why study of this initiative would be important to other similar health care organizations and possibly have regional or national significance. The quality or safety issue being used as the basis for the case study cannot be a quality or safety project in which the student candidate was personally involved. (The final written product should be approximately 20-40 pages.)

HQPS Track Qualifying Exam Committee
The student should assemble a group of 3 – 4 Northwestern University faculty with knowledge and/or experience in the topic and methods of interest. The Track Leader and either one of the HSIP Director or Associate Director are to be included on the Committee.

Engagement and Permissions
After receiving initial verbal approval from relevant decision makers related to the focus of the case study, the student will formally layout the necessary elements for the case study data collection (e.g., permission to conduct interviews with key individuals, access to review performance data, access to relevant documents – educational materials, reports, publications, relevant websites, Institutional Review Board documents and communications) and then signed in writing by key decision makers related to the focus of the case.

The student should submit an IRB application describing the focus of the case study, its purpose, and the study methods. Most frequently the IRB will determine that this type of study is "not human subjects' research" as the focus is on the intervention and the related improvement.

The Track Exam
The Exam will consist of:
I.	A written proposal including the elements described below
II.	An oral presentation and defense of the proposal
III.	Case study written document
IV.	A second coder for qualitative data analysis required. The track leader will ensure that the student has access to a second coder.
V.	An oral presentation of the case study

Description of Case Study: Key elements
- Background/Overview: A comprehensive review of the organization's perspective on the quality or safety gap at the start of the case timeline.
- Case study methods (briefly)
- The steps the institution went through to identify the nature and scope of the problem (use of a timeline format is suggested).
- Specific event(s) that prompted the organization to observe the quality or safety gap.
- The scope (department, unit, institution, multiple institutions, policy)

- o Description of what was done
- o A critique of key decisions
- The team, which should include:
  - o Strategic decisions for engagement
  - o Who was involved on the team and their roles and rationale
- How the organization will address these challenges (i.e., the process for determining a potential solution)
- For each of the following, the case study should include:
  - o Description of what was done
  - o A critique of key decisions
  - o Description of lessons learned
- The intervention(s) to be implemented
- Measures- Proximal (to ensure intervention is implemented as planned) and distal outcomes (to assess change)
- Methods for implementation- Action plans, timing
- Sustainability and spread
- Key barriers
- Change in target measures
- Key features of success
- Summary of critique of key decisions, lessons learned and features of success
- Results of data collected
- Discussion

Research Methods

Identifying and implementing an intervention to solve a quality or safety gap at a single healthcare organization could represent a generalizable solution to a problem. However, due to many unique environmental issues within a single institution, it is possible that an intervention designed for a single institution could have limits (threats) to generalizability. For this portion of the qualifying exam, the candidate is asked to describe the experimental design and methods by which the intervention identified and method for implementation (action plan) could be assessed for generalizability to provide value to a larger number of healthcare organizations.

The final written proposal document should be brief (6-8 pages) and should include:
- Introduction/Background
- Rationale
- Research Methods
  - o Research Design
  - o Study Population
  - o Data Collection
  - o Analyses
  - o Criteria
- Tied to literature

- Tied to national policy
- Case study timeline

Oral Presentation of the Written Proposal Document

The student should schedule the members of the Qualifying Exam Committee for a period of 2 hours.

The student will make a 20-25 minute presentation. This section of the exam should generally follow the outline of the written document. The student should be prepared to answer questions throughout the presentation and proposal defense. For approval to begin conducting the case study, the Committee will evaluate the presentation of the case study description, methods, rationale, and relevant study elements. The student will be evaluated on a cogent presentation of these as well as on the student's ability to answer questions and defend elements of study methods and rationale.

There are three categories of evaluation in preparation for initiating the Case Study:

- Pass – Based on the high quality of the written document and presentation, the student may proceed with the case study
- Pass with Minor Revisions – generally the student should incorporate the feedback and proceed
- Pass with Major Revisions – The student must modify the document according to the Committee's feedback and resubmit the document for approval by either the Committee Chair or the whole Committee, to be determined by the Committee at the end of the presentation.
- Fail- Did not demonstrate or meet minimum standards of successful academic performance

The student can proceed with the case study when the student has received approval from the Committee Chair or the whole exam committee. At that time, the student will have approximately 12 weeks to complete the case study.

Exam - Case Study Document

Upon completion of the proposed Case Study, the student will submit a written document (20-40 pages) describing the conduct of the Case Study, including:

- Introduction/Background
- Rationale
- Research Methods
  - Research Design
  - Study Population
  - Data Collection
  - Analyses
- Results
- Discussion
- Limitations
- Conclusions
- Implications and potential future research

Oral Presentation of the Case Study

The student should schedule the members of the Qualifying Exam Committee for a period of 2 hours for the Oral Exam. The student will make a 20-25 minute presentation. This section of the exam should generally follow the outline of the written document.

The student should expect and be prepared to answer questions throughout the presentation and defense. The student will be evaluated on a cogent presentation of these as well as on the student's ability to answer questions and defend elements of the case study.

Evaluation of Performance

To earn a grade of "Pass," the case study should be of high quality, and ready or nearly ready (i.e., only a few minor edits needed) for submission to an appropriate journal or as a conference abstract. Please talk to the Exam Committee for suggestions for appropriate journals. The committee will critically assess the review in terms of the:

- Contribution to knowledge, theory, policy, or practice;
- Approach/methods;
- Findings, in particular, how they are presented and interpreted;
- Limitations
- Conclusions and implications; and
- Writing quality, clarity, and style, and the organization of the information presented.

A.3.2 Integrated Exam
The student will develop a thorough narrative review and demonstrate the student's mastery of a chosen and approved area of study that crosses the student's HQPS Track and some aspect(s) of another HSIP Track. It is not to be a systematic review evaluating the level of the existing evidence in the area, but a literature review representing the content and implications of the selected area of study. Student should use the HQPS Integrated Exam planning form to guide the process of developing the proposal for the Integrated Exam. Students will be given 12 weeks to complete the integrated exam.

HQPS Track Integrated Qualifying Exam Committee
The student should assemble a group of 3 – 4 Northwestern University faculty with knowledge and/or experience in the topic of interest. The Track Leader and either one of the HSIP Director or Associate Director are to be included on the Committee.

HQPS Integrated Exam Topic Selection
The student, in collaboration with their committee, shall identify a topic/question crossing the student's Track and another HSIP Track. In consultation with the Chair and Committee content experts, the student shall develop a list of literature to review and summarize. The list should include current sources and seminal works that inform the topic of study and its evolution.

The Integrated Exam
The Exam will consist of:
I.   A written proposal including the focus/question and proposed list of literature
II.   An oral presentation of the integrated exam proposal
III.   A written integrated exam paper
IV.   An oral presentation of the integrated exam document

Oral Presentation of the Integrated Exam Proposal

The student should schedule the members of the Qualifying Exam Committee for a period of 2 hours for the Oral Exam. The student will make a 20-25 minute presentation. This section of the exam should generally follow the outline of the written document. The student should be prepared to answer questions throughout the presentation and proposal defense. For approval to begin to conduct the exam, the Committee will evaluate the presentation of the description, methods, rationale, and relevant study elements. The student will be evaluated on a cogent presentation of these as well as on their ability to answer questions and defend elements of study methods and rationale.

There are four categories of evaluation in preparation for initiating the Integrated Exam:
- Pass – Based on the high quality of the written document and presentation the student may proceed with the exam
- Pass with Minor Revisions – generally the student should incorporate the feedback and proceed
- Pass with Major Revisions – The student must modify the document according to the Committee's feedback and resubmit the document for approval either to the Committee Chair or whole Committee, as determined by the Committee at the end of the oral presentation.
- Fail –– Did not demonstrate or meet minimum standards of successful academic performance

The student can proceed with the integrated exam document when the student has received approval from the Committee Chair or the whole exam committee. At that time, the student will have approximately 12 weeks to complete the integrated exam.

Submission of the Integrated Exam Document and Presentation

Upon completion of the proposed narrative review, the student will submit a written document that analyses and summarizes the literature. The student should schedule the members of the Qualifying Exam Committee for a period of 2 hours. The student will make a 20-25 minute presentation. This section of the exam should generally follow the outline of the written document. The student should expect and be prepared to answer questions throughout the presentation and defense. The student will be evaluated on a cogent presentation of the exam document.

Evaluation of Performance

To earn a grade of "Pass," the literature review should be of high quality, and ready or nearly ready for submission to a peer-review journal. The Committee will critically assess the review in terms of the:
- Demonstration of a comprehensive understanding of the integrated topic
    - Contribution to knowledge, theory, policy, or practice;
    - Approach/methods;
    - Finding, in particular, how they are presented and interpreted;
    - Representations of the study's limitations
    - Conclusions and implications; and
    - Writing quality, clarity, and style, and the organization of the information presented.

A.4. Social Sciences and Health

A.4.1 Track Specific Exam

The student will develop a **systematized review** on an SSH topic **related to the student's research interests**. The paper should be planned, developed, and formatted for a relevant journal, such as *Social Science and Medicine*. The systematized review should follow the methodology described by the [Galter Research Library](#).

Using the **qualifying exam planning worksheet**, the student will submit 2 possible topics for the systematized review to the committee chair. The committee chair will identify committee members and together the committee will choose the final topic.

Students will begin the exam in **Fall quarter of their 2nd year** and be given **8 weeks** to complete the systematized review. Students are encouraged to meet with Galter Library research librarian to plan their search strategy prior to submitting the planning form.

Failure to submit the review by the deadline will result in a grade of "Fail." Students needing an extension should request one (including justification) as early as possible.

Oral Presentation of the written document (20 minutes by the student). The student should schedule a 90 minute meeting with the exam committee. The student presentation should generally follow the outline of the written document.

Evaluation of Performance

To earn a grade of "Pass," the systematized review should be of high quality, and ready or nearly ready (i.e., only a few minor edits needed) for submission to a peer-review journal.

Criteria for Grading the Written Examination

The committee will critically assess the review in terms of the:
- Contribution to knowledge, theory, policy, or practice;
- Approach/methods;
- Finding, in particular, how they are presented and interpreted;
- Conclusions and implications; and
- Writing quality, clarity, and style, and the organization of the information presented.

Criteria for Grading the Oral Examination

- Is the student able to engage in a positive scientific discussion with the committee?
- Is the student able to verbally express sophisticated scientific concepts?
- Is the student able to answer questions about the literature that demonstrate that they understand the critical issues in the domain?

A.4.2 Integrated Exam
The student will prepare a **mock grant proposal** that draws on knowledge across multiple tracks. The topic can be related to**, but not identical** to the student's dissertation. Students are expected to prepare a one-page Specific Aims and a six-page Research Strategy. The Research Strategy should follow the formatting of an R21 or R03 NIH proposal (i.e. significance, innovation, and approach) and be expected to reflect 2 years of work. The specific format and considerations for each section are as follows:

Specific Aims

The Specific Aims page should succinctly describe the general area of study, the main question(s) addressed, the rationale behind the choice of this qualitative or empirical approach, the approach, and the significance of the study. If appropriate, this page will also indicate the hypothesis and specific aims of the proposal.

Research Strategy

Organize the **Research Strategy** in the specified order and using the instructions provided below. Start each section with the appropriate section heading – Significance, Innovation, Approach. Use citations (where appropriate) in the Research Strategy section and provide the full reference in the References section.

THE RESEARCH STRATEGY SHOULD BE A MAXIMUM OF 6 PAGES. (not counting references)

Background and Significance

- Provide a critical literature review covering areas of evidence and theory relevant to your proposal, including consideration of the scientific rigor of the existing evidence.
- Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.
- Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.
- Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

Innovation

- Explain how the application challenges and seeks to shift current research or clinical practice paradigms.
- Describe any novel theoretical concepts, approaches or methodologies, instrumentation or interventions to be developed or used, and any advantage over existing methodologies, instrumentation, or interventions.
- Explain any refinements, improvements, or new applications of theoretical concepts, approaches or methodologies, instrumentation, or interventions.

Not that you may not need to address all these bullet points in the Innovation section. Some may be more relevant to your proposal than others. The idea is to build on the background you presented in the Significance section to make the strongest case possible for innovation in your proposed research, focusing on truly innovative features of your proposal.

Approach

- Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project.
- Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.
- Include a timeline for the proposed study.

If the proposal has multiple Specific Aims, then the Research Strategy may address Significance, Innovation and Approach for each Specific Aim individually, or may address Significance, Innovation and Approach for all of the Specific Aims collectively.

REFERENCES. In addition to the 6 pages for the primary grant document, the student has an unlimited number of pages in which to provide the references that support their proposal. To ensure in-depth knowledge in the proposed field of research, *students are expected to read and understand the most important papers in the field of interest as a necessary antecedent to developing their proposal. These papers and any other reference information supporting the statements in the Background and Significance, Innovation, or Approach section should be supplied as references to the proposal.*

Although the proposal will focus on SSH topics**, it must include at least <u>one aim</u> that addresses a major topic from one other HSIP Track**, such as Healthcare Quality and Patient Safety, Health Services and Outcomes Research, Health and Biomedical Informatics or Biostatistics.

The question addressed should be distinct from the student's proposed dissertation work. It must also be distinct from the work of others in the lab and must not be a component of any of the lab's current work or work described in a written proposal or discussed as part of the lab's future directions. The proposed work should be well grounded in the published literature and not based only on – or simply repeat methods used to collect – preliminary data already generated by the student or in the student's lab.

The proposal must be the work of the student. Naturally, many ideas contained in a proposal may have been formulated during interactions between the student and the advisor or other scientists, both from within and outside the lab. As a natural part of a student's lab experience, the scope, aims, and experimental approaches for a project may have been discussed. The student alone, however, must come up with the topic suggestions and write the proposal. Neither the faculty advisor nor any other individual (e.g., students, post-doctoral fellows) should provide input on the suggested topics or edit the proposal prior to its submission. The student will affirm the originality of the document by placing the following passage on the cover page of their proposal:

"The work in this proposal represents the original work of (insert student's name), who received only general help in regard to the proposed aims and the overall preparation of the proposal."

A student will receive a grade of FAIL if it is determined that he or she did not follow these rules and obtained substantial help. Students with knowledge of such cheating should report violations to the HSIP Director or Associate Director.

Using the **qualifying exam planning worksheet**, the student will submit 2 possible topics for the mock grant proposal to the committee chair. The committee chair will identify committee members and together the committee will choose the final topic.

Students will begin the exam in **Summer quarter of their 2nd year** and be given **4 weeks** to complete the mock grant proposal. Failure to submit the review by the deadline will result in a grade of "Fail." Students needing an extension should request one (including justification) as early as possible.

Oral Presentation of the written document (20 minutes by the student). The student should schedule a 90-minute meeting with the exam committee. The student presentation should generally follow the outline of the written document.

Questions during the oral exam can be comprehensive in nature to allow the committee to ascertain whether the student has mastered the knowledge base required to conduct the proposed experiments and to understand the background and significance of the proposal. No outside help on preparing the presentation or preparing for potential questioning is permitted.

Evaluation of Performance

Proposals will be evaluated based on significance, innovation, and technical merit of the approach including the quality of the analysis plan and the quality and clarity of the written work. To earn a grade of "Pass," the proposal should be of high quality, and ready or nearly ready (i.e., only a few minor edits needed) for submission to a funding body and reflect the student's potential to propose independent research. The exam committee will provide detailed and direct feedback to the student. The evaluation will address the criteria below.

Criteria for Grading the Written Examination

- **General**
    - Are the proposed aims of the project independent, feasible, properly controlled, and of reasonable scope?
    - Does at least one aim relate to the selected secondary track?
- **Background and Significance**
    - Is the background concise and relevant to the proposal?
      Is the relevant literature reviewed and critically evaluated and are primary references (as opposed to review articles) cited where appropriate?
      Is the proposed project technically and/or conceptually innovative?
    - Does the review reflect the current state of knowledge in sufficient detail?
    - Does it clearly identify the gap in knowledge that motivates the proposal?
- **Innovation and Approach**
    - Is there a clearly stated and acceptable hypothesis, if appropriate?
    - Do the proposed empirical approaches adequately test the hypothesis?
    - Does each qualitative or empirical approaches have a rationale?
    - Are the proposed approaches feasible, properly controlled, and of reasonable scope?
    - Are the approaches descried in sufficient detail to demonstrate adequate mastery of the research area?
    - Does the proposal predict all potential outcomes of the approach and are alternative approaches proposed when necessary?
- **Written Communication Skills**
    - Is the proposal clearly written and carefully edited, and does it comply with the conventions of proposal writing?

Criteria for Grading the Oral Examination

- **Oral Communication Skills**

- o Is the student able to engage in a positive scientific discussion with the committee? Is the student able to verbally express sophisticated scientific concepts?
- o Is the student able to answer questions about the proposal that demonstrate that they understand the critical issues in the domain?

A.5. Biostatistics

A.5.1 Track Specific Exam

The track specific qualifying exam will consist of two parts: a statistical theory part which covers the contents of the core track specific theoretical courses during the first year, and an applied part which covers the contents of the core track specific applied courses during the first year. The theoretical part will be an in class written exam with up to 6 hours. The applied part will be a take-home exam for up to 4 days that requires programming with statistical software. Students are expected to take the track specific exam as a cohort in September prior to the start of their second year in the program.

Criteria for Grading the Written Examination

The track specific qualifying exam committee will grade the written material. To earn a grade of "Pass," the written material should demonstrate adequate comprehension of knowledge covered by both the track-specific theoretical and applied courses.

A.5.2 Integrated Exam

The integrated exam will test the student' ability to adapt and apply the knowledge learned to carry out appropriate statistical analyses for addressing research questions related to one of the other HSIP tracks. The track leader will assemble a group of 3-4 Northwestern Faculty with knowledge and/or experience in the topic of the interest as the qualifying exam committee. The Track Leader and either one of the HSIP Director or Associate Director are to be included on the Committee. The student, in collaboration with the integrated qualifying exam committee, shall identify an appropriate dataset and research questions. The integrated exam will consist of:

I. A written proposal including the description of the dataset and the study, a statement of the research questions, analysis plan, and anticipated results (using the exam planning form)
II. A written integrated exam document
III. An oral presentation of the integrated exam document

Although the proposal will focus on BIOSTAT analysis**, it must address a major topic from one other HSIP Track**, such as Healthcare Quality, Health Services and Outcomes Research, Health and Biomedical Informatics or Social Sciences and Health.

The proposal must be the work of the student. Naturally, many ideas contained in a proposal may have been formulated during interactions between the student and the advisor or other scientists, both from within and outside the lab. As a natural part of a student's lab experience, the scope, aims, and experimental approaches for a project may have been discussed. The student alone, however, must come up with the statistical formulation of the research question. Neither the faculty advisor nor any

other individual (e.g., students, post-doctoral fellows) should edit the proposal prior to its submission. The student will affirm the originality of the document by placing the following passage on the cover page of their proposal:

"The work in this proposal represents the original work of (insert student's name), who conducted the statistical analyses and write the proposal alone."

A student will receive a grade of FAIL if it is determined that he or she did not follow these rules and obtained substantial help. Students with knowledge of such cheating should report violations to the HSIP Director or Associate Director.

Using the **qualifying exam planning worksheet**, the student will work with the committee chair to choose a topic for the data analysis. Students may begin the integrated qualifying exam after they pass the track-specific qualifying exam. Students will have **12 weeks** to complete the written integrated exam document after the committee approves the written proposal. The integrated exam can begin after the track specific exam. Failure to submit the document by the deadline will result in a grade of "Fail." Students needing an extension should request one (including justification) as early as possible.

Oral Presentation of the written document (20 minutes by the student). The student should schedule a 90-minute meeting with the exam committee. The student presentation should generally follow the outline of the written document.

Questions during the oral exam can be comprehensive in nature to allow the committee to ascertain whether the student has mastered the knowledge base required to conduct the proposed experiments and to understand the background and significance of the proposal. No outside help on preparing the presentation or preparing for potential questioning is permitted.

Criteria for Grading the Written Examination

- **General**
    - Are the proposed aims of the project independent, feasible, properly controlled, and of reasonable scope?
    - Does at least one aim relate to the selected secondary track?
- **Background and Significance**
    - Scientific background present that supports the need for the project (indicating the gap in current literature);
    - Aims of the project are clearly stated;
    - Study population is clearly described and appropriate for objectives;
    - Study design is clearly explained and appropriate to address study aims;
    - Outcome variable(s) are clearly defined, including whether they will be treated as continuous, categorical, etc.;
    - Predictors and covariates are clearly defined (e.g., exposure status, study arm, disease severity) and appropriate to address study aims;
    - Data collection and measurement methods are clearly explained;
    - The analysis plan is clear and appropriate to address study aims;
    - Statistical assumptions are discussed (e.g., sample size calculation assumptions, normality, type I/II error, etc.);

- o Estimates are clearly identified (e.g., as odds ratio, mean, etc.), presented with appropriate measures of significance or variability, and appropriate number of significant digits;
- o Important findings are summarized, with discussion on plausibility;
- o The addition(s) to the literature and novelty of findings are discussed;
- o Limitations and strengths are clearly identified and addressed as appropriate;
- o Writing quality, clarity, and style, and the organization of the information presented

- **Written Communication Skills**
  - o Is the proposal clearly written and carefully edited, and does it comply with the conventions of proposal writing?

Criteria for Grading the Oral Examination

- **Oral Communication Skills**
  - o Is the student able to engage in a positive scientific discussion with the committee? Is the student able to verbally express sophisticated scientific concepts?
  - o Is the student able to answer questions about the analysis that demonstrate that they understand the critical issues in the domain?