Health Sciences Integrated Program
PhD Student Handbook
2021-22

NORTHWESTERN
UNIVERSITY

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1. Welcome and Contacts

Welcome to the Health Sciences Integrated PhD Program. 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. The Health Sciences Integrated Program (HSIP) offers doctoral student training across multiple disciplines and the opportunity to focus on a broad array of tracks within the health sciences including: health and biomedical informatics, health services and outcomes research, healthcare quality and patient safety, and social sciences and health.

1.1 Program Overview

The Health Sciences Integrated Program (HSIP) is housed within the Center for Education in the Health Sciences at the Institute for Public Health and Medicine (IPHAM) at the Feinberg School of Medicine (FSM). The Program was developed as an in-person program, and we require in-person activity for students to make timely progress towards their degree. HSIP is a collaboration across IPHAM centers and FSM departments including Center for Health Services and Outcomes Research, Northwestern University Biomedical Informatics Center, 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

Lucy Bilaver, PhD
Director
Phone: 312-503-5618
E-mail: l-bilaver@northwestern.edu
Office: 633 N St. Clair, 20th Floor

Richard Epstein, PhD, MPH
Associate Director
Phone: 312-503-5454
E-mail: richard.epstein@northwestern.edu
Office: Abbott Hall, 9th floor

Erica Ramos
Program Coordinator
Phone: 312-503-5533
E-mail: erica.ramos@northwestern.edu
Office: 633 N St. Clair, 20th floor

Emily McElroy
Center for Education in Health Sciences Program Administrator
Phone: 312-503-5522
E-mail: Emily.mcelroy@northwestern.edu
Office: 633 N St. Clair, 20th Floor

1.3 Oversight Committee

As an interdisciplinary program, an HSIP Oversight Committee with faculty representatives from each track governs the program. HSIP Oversight Committee responsibilities include overseeing the admission process, reviewing student progress reports each spring, and overseeing the approval process for HSIP curriculum changes. The HSIP Oversight Committee is chaired by the HSIP Director.

Oversight Committee Members

Health Services and Outcomes Research	Megan McHugh, PhD Associate Professor of Emergency Medicine
Health and Biomedical Informatics	Justin Starren, MD, PhD Chief, Division of Preventive Medicine-Health and Biomedical Informatics, Professor of Preventive Medicine-Health and Biomedical Informatics and Medical Social Sciences
Healthcare Quality and Patient Safety	Donna M Woods, PhD Professor of Pediatrics
Social Sciences and Health	Judith Moskowitz, PhD, MPH Professor of Medical Social Sciences
HSIP	Lucy Bilaver, PhD (Director) Associate Professor of Pediatrics
HSIP	Richard Epstein, PhD, MPH (Associate Director) Research Professor of Psychiatry and Behavioral Sciences

2. Program Requirements

2.1 Program Curriculum

The wide range of opportunities provided within HSIP serves both those students committed to a specific research field when they enter and those who begin with several potential interests. During the first year of the HSIP doctoral program, each student will identify a specific curriculum/research track while also achieving a set of core competencies that applies across all tracks.

The core competencies include:

- Ethics
- Informatics
- Measurement and Outcomes
- Research Design
- Statistical Methodology
- Writing and Communication

To achieve the core competencies students are required to take one course in each of the following areas:

- Measurement and outcomes
- Research design
- Statistical methodology

- Writing

Additionally, all students will be required to take HSIP 400, Interdisciplinary Health Sciences Doctoral Colloquium, a one-unit course that convenes during Fall, Winter, and Spring Quarters of the first year. The course introduces students to the disciplines within the Health Sciences and is taught collectively by HSIP faculty. The core competencies of Ethics, Informatics, and Writing & Communication will be covered as part of the Interdisciplinary Health Sciences Doctoral Colloquium.

Tracks or certain fellowships may require additional courses or training.

The program contains the following active tracks:

- Health and Biomedical Informatics (HBMI)
- Health Services and Outcomes Research (HSOR)
- Healthcare Quality and Patient Safety (HQPS)
- Social Sciences and Health (SSH)

The other 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
MHI 403 Introduction to Medical Informatics
BIOSTAT 302 Introduction to Biostatistics
HSIP 441 Informatics Methods I
HSIP 442 Informatics Methods II
HSIP 443 Informatics Methods III
HSIP 401 Introduction to Health Measurement Science
BIOSTAT 402 Intermediate Biostatistics*
HSR 462 Grant Writing (0.5 unit)**
Choose one Health Care and Biomedical Knowledge
BMD_ENG 301 Systems Physiology
IBIS 401 Molecular Biophysics
IBIS 402 Eukaryotic Molecular Biology
IBIS 403 The Human Proteome: Defining Variation and Modifications of Protein Molecules
IBIS 404 Principles and Methods in Systems Biology
IBIS 406 Advanced Topics in Cell Biology
IBIS 407 Genetics & Epigenetics

IBIS 410 Quantitative Biology
IEMS 385 Introduction to Health Systems Management
IGP 401 Biochemistry
IGP 405 Cell Biology
IGP 410 Molecular Biology
IGP 420 Introduction to Pharmacology
IGP 430 Genetics
IGP 435 Signal transduction and human diseases
IGP 440 Immunology
IGP 442 Microbiology
IGP 450 Tumor Cell Biology
IGP 466 Structural Basis of Signal Transduction
IGP 475 Virology
IGP 485 Data Science for Biomedical Researchers
IGP 486 Advance Bioinformatics and Genome Informatics
MGMT 444 Health Economics
MHI 401 American Healthcare System
MHI 402 Introduction to Clinical Thinking
MHI 404 Health Care Enterprise Operations
MHB 403 The History of Medicine and Bioethics
MSHA 403-DL American Healthcare, Digital Health and Analytics
PUB_HLTH 301 Behavior, Society, & Health
PUB_HLTH 412 Infection Disease Epidemiology and Prevention
HQS 420 Introduction to US Healthcare System
HSR 433 Health Economics and Healthcare Financing
HSR 470 Federal Policy Making and Health Care Reform
Choose one Computation
BIOSTAT 305 Applied Statistical Programming in SAS
MHI 406 Decision Support Systems
MHI 405 HIT Standards
MSDS 430 Python for Data Science
MSIA 422 Intro to Java and Python
MSHA 401 Programming for Health Analytics
Recommended Electives (choose 3 or more)* **
BIOSTAT 429 Systematic Review and Meta-Analysis in the Medical Sciences
MHI 404 Health Care Enterprise Operations
MHI 407 Legal, Ethical & Social Issues in Informatics
MHI 413-DL Consumer eHealth
MSCI 330 Electronic Health Record Data as a Foundation for Clinical Research
PUB_HLTH 425 Introduction to GIS and Spatial Analysis for Public Health
PUB_HLTH 431 Basic Decision Analysis and Models of Medical Decision Making
PUB_HLTH 438 Survey Design and Methodology

PUB_HLTH 439 Qualitative Research Methods
PUB_HLTH 444 Advanced Decision Analysis
PUB_HLTH 445 Writing and Peer Reviewing for Scientific Publication
HQS 440 Fundamental Methods for Healthcare Quality and Patient Safety
HSR 425 Introduction to Quantitative Methods in Health Services and Outcomes Research
HSR 463 Topics in HSR: Healthcare Quality and Patient Safety (0.5 unit)
IGP 422 Introduction to Translational Research
IGP 466 Structural Basis of Signal Transduction

*If students have a background in calculus, they should take BIOSTAT 402 to fulfill the Intermediate Biostatistics requirement. Students without prior calculus 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.
***Other electives may be taken with advisor approval.

2.2.1.1 Medical Sciences Training Program/Health and Biomedical Informatics Track

Students in the Medical Sciences 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. Compared with HBMI 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, one Health Care and Biomedical Knowledge course, and three electives. Waivers of BIOSTAT 302 Introduction to Biostatistics and HSR 462 Grant Writing are based on the content of the Medical Decision Making and MSTP Grant Writing courses, respectively.

MSTP students will be required to take the following courses for a total of 8 units:

Required Courses
HSIP 400 Interdisciplinary Health Sciences Doctoral Colloquium
MHI 403 Introduction to Medical Informatics
HSIP 441 Informatics Methods I
HSIP 442 Informatics Methods II
HSIP 443 Informatics Methods III
HSIP 401 Introduction to Health Measurement Science
BIOSTAT 402 Intermediate Biostatistics*
Choose one Computation
BIOSTAT 305 Data Management & Analysis in SAS
BIOSTAT 428 Bioinformatics and Data Mining
MHI 406 Decision Support Systems
MHI 405 HIT Standards
MSDS 430 Python for Data Science
MSIA 422 Intro to Java and Python

MSHA 401 Programming for Health Analytics

*If students have a background in calculus, they should take BIOSTAT 402 to fulfill the Intermediate Biostatistics requirement. Students without prior calculus should take PUB_HLTH 421 Intermediate Biostatistics, CLIN_PSY 426 Research methods (Statistics) II, or other equivalent approved by the student's advisor.

Note: 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
PUB_HLTH 302 Introduction to Biostatistics
PUB_HLTH 421 Intermediate Biostatistics
HSIP 401 Introduction to Health Measurement Science
HSR 425 Introduction to Quantitative Methods in HSOR
HSR 433 Health Economics and Healthcare Financing
HSR 456 Applied Qualitative Methods & Analysis for Health Researchers
HSR 460: Ethical Issues in Health Service Research (0.5 unit)
HSR 462 Grant Writing (0.5 unit)
HSR 465 Intermediate Quantitative Methods in HSOR
PUB_HLTH 438 Survey Design & Methodology
PUB_HLTH 445 Writing and Peer Reviewing for Publication
Recommended Electives (choose 3 or more)*
MHI 403 Introduction to Medical Informatics
HSR 470 Federal Policy Making and Health Care Reform
PUB_HLTH 323 Health Equity

*Other electives may be taken with advisor approval.

2.2.3 Healthcare Quality and Patient Safety

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
HQS 401 Introduction to Healthcare Quality
HQS 402 Introduction to Patient Safety
HQS 420 Introduction to Health Management
HQS 440 Fundamental Methods in Healthcare Quality and Patient Safety
HQS 501 Advanced Healthcare Quality
HQS 502 Advanced Patient Safety
HQS 510 The Business of Quality and Safety Improvement
HSIP 401 Introduction to Health Measurement Science
PUB_HLTH 445 Writing and Peer Reviewing for Publication
BIOSTAT 302 Introduction to Biostatistics**
BIOSTAT 402 Intermediate Biostatistics**
Choose one Research Design
BIOSTAT 301 Introduction to Epidemiology
HSR 425 Introduction to Quantitative Methods in HSOR
Recommended Electives (choose 2 or more)*
HSR 433 Health Economics and Healthcare Financing
HSR 456 Applied Qualitative Methods and Analysis for Health Researchers
HSR 470 Federal Policy Making and Health Care Reform
MGMT 444 Health Economics
MGMT 945 Healthcare Strategy
MHB 401 Foundations of Bioethics
MHB 402 Medicine and Law
MHB 403 The History of Medicine
MORS 430 Leadership in Organizations
MORS 452 Leading the Strategic Change Process
MORS 460 Leading and Managing Teams
PUB_HLTH 301 Behavior, Society, and Health
PUB_HLTH 415 Disease Prevention and Health Promotion
PUB_HLTH 431 Decision Analysis and Models of Decision Making
PUB_HLTH 438 Survey Design and Methodology
PUB_HLTH 439 Qualitative Research Methods
PUB_HLTH 444 Medical Cost Effectiveness
PUB_HLTH 449 Public Health Policy

*Independent Study or other appropriate courses which are identified by the student and approved by the student's advisor, and the course faculty.

**If students have a background in calculus, they should take BIOSTAT 302 and BIOSTAT 402 to fulfill the biostatistics requirements. Students without prior calculus should take PUB_HLTH 302 (Introduction to

Biostatistics) and either PUB_HLTH 421 Intermediate Biostatistics or 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 patient centered outcomes, their mechanisms, and intervention applications via training at the scientific interface of biomedical and social sciences. Particular emphasis is placed on measurement of quality of life, behavioral and functional outcomes, applications that improve quality of life, health and health care at the individual and systems levels, as well as the developmental mechanisms that shape these outcomes across the lifespan. The overarching goal of this track is to train scientists who are experts in a particular area of patient-centered outcomes research (e.g. outcomes science, developmental mechanisms, behavior and health), while also developing proficiency in multiple areas of relevance to leading an innovative team.

Required Courses
HSIP 400 Interdisciplinary Health Sciences Doctoral Colloquium
BIOSTAT 302 or PUB_HLTH 302 Introduction to Biostatistics
BIOSTAT 402 Intermediate Biostatistics or PUB_HLTH 421 Intermediate Biostatistics
BIOSTAT 301 Introduction to Epidemiology or HSR 425 Introduction to Quantitative Methods in Health Services and Outcomes
HSIP 401 Introduction to Health Measurement Science
PH 301 Behavior, Society, and Health
HSIP 430 Introduction to Social Sciences and Health
PUB_HLTH 445 Writing and Peer Reviewing for Publication
HSR 462 Grant Writing (0.5 unit)
Choose one of the following required courses:
STAT 348 Applied Multivariate Analysis
ANTHRO 306 Evolution of Life History Strategies
PSYCH 401-2 Psychology Proseminar: Social & Personality Bases of Behavior
Recommended Electives (choose four)**
HSR 485 Intermediate Quantitative Methods in Health Sciences and Outcomes Research
PUB_HLTH 323 Health Equity
HSR 470 Federal Policy Making and Health Care Reform
PUB_HLTH 438 Survey Design and Methodology
PSYCH 405 Psychometric Theory
PSYCH 451 Statistics in Experimental Design

*Other courses to fulfill the ethics requirement may be taken with advisor approval

**Other electives may be taken with advisor approval

2.3 General Guidance on Electives

In addition to the courses listed above, 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.

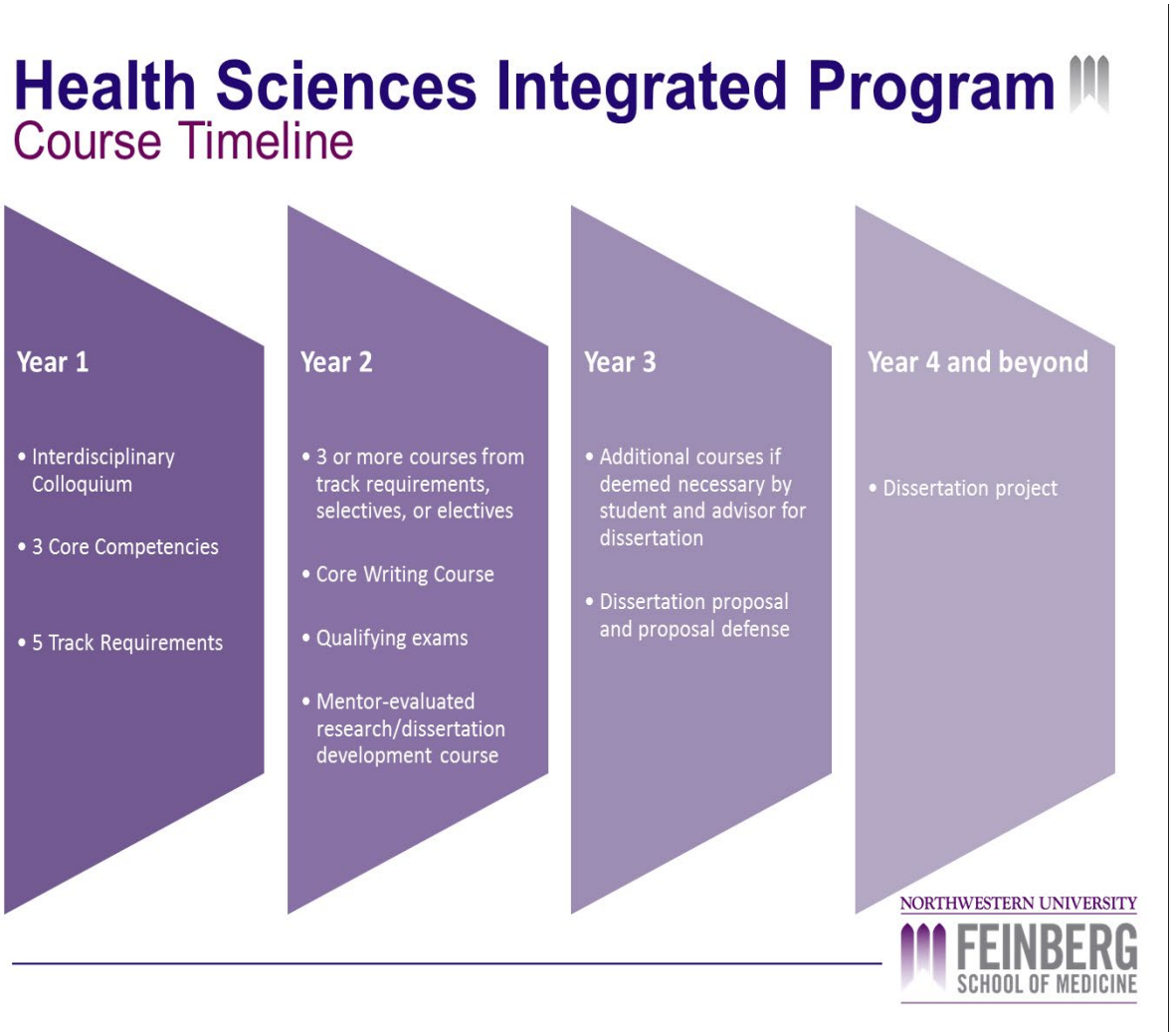
2.3.1 Course Options through CIC (Committee on Institutional Cooperation) and CME (Chicago Metropolitan Exchange)

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: Chicago Metropolitan Exchange Program

2.4 General Timeline to Degree



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.

The HSIP tracks require between 14 and 15 graded graduate level courses (see track-specific curricula) as part of the curriculum. The Graduate School 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 Director reserves the right to waive course requirements and may defer to the Oversight Committee in certain cases.

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.

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 listing of the available courses for the quarter and a description of the registration procedures to all PhD students shortly before registration opens.

Use CAESAR (Computer Assisted Electronic Student Access Route, available at http://www.registrar.northwestern.edu/ (accessible using your NU NetID and password) to register for classes. The Registrar's office has a tip sheet, available at http://ses.northwestern.edu/documentation/SC_Registration_Tip_Sheet_v9.pdf

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

Some courses are housed in the School of Professional Studies (SPS) which incurs at $125 Distance Education Fee (paid by the students) and requires the following for registration:

- Advisor approval via email,
- Completed Dual Registration Form (https://www.registrar.northwestern.edu/documents/dualregformfillable.pdf), and
- Approval from the appropriate program's Associate Director (AD).

Administrative Director (AD) contacts for SPS registration are as follows:

Masters of Science in Data Science (MSDS)	Beth Lair (beth.lair@northwestern.edu)
Masters of Health Informatics (MHI)	Mary Brennan (mbrennan@northwestern.edu)

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.

Department contacts for permissions numbers are as follows:

MSCI	Adam W White adam-white@northwestern.edu
PUB HLTH	Diana Sayago diana.sayago@northwestern.edu
BIOSTAT	Diana Sayago diana.sayago@northwestern.edu
HSR	Ryan Splitt ryan.splitt@northwestern.edu
HSIP	Erica Ramos erica.ramos@northwestern.edu
HQS	Jamie Perry jamie.perry@northwestern.edu

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 you decide to drop a class, please notify both the instructor and program administration. However, the student must officially drop the class in CAESAR; program staff cannot do this. If you fall below full-time registration, your 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. Please speak with program staff if you intend to drop a Summer Quarter course.

2.10 Instructional Experience

Students in HSIP will be 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 experience will be coordinated by the HSIP administrative team, with an aim to find Teaching Assistant 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. Other potential teaching experiences will include organizing and leading a multi-week section of the HSIP Colloquium course and other introductory courses within the master's

programs. The Searle Center offers training for new TAs: https://www.northwestern.edu/searle/initiatives/grad/new-ta-conference/index.html .

A Teaching Experience form (available on the Current Students section of the website) must be submitted to the Associate Director and Program Coordinator in the quarter prior beginning the teaching experience. Please note, you will be required to turn in evaluation forms from your students, so please arrange for these to be distributed through the instructor or with the Program Coordinator.

Please note that teaching does fall under The Graduate School's definition of part-time work if it meets the criteria for receiving additional pay are meet. Please see section 4.3 Working below for the criteria. TAs can work with the instructor and the home department of the course to negotiate an appropriate form of payment for their work if this option is made available by the department and instructor to the student.

2.11 Monitoring Progress toward the PhD

Each student is required to submit an annual progress report that is completed jointly with their Academic Advisor. The purpose of completing this annual review is to assess the progress being made through the academic milestones and toward scholarship activities as well as to provide constructive feedback to both the student and the Academic Advisor.

The HSIP Student Progress Report is due on June 15th of each year. The student first completes the assessment form and writes a brief paragraph summarizing their long-term career goals and research interests. The student may also note any concerns or plans that are not indicated on the form. The student meets with the Academic Advisor to review the completed form and discuss the student's progress and plans for the upcoming year. It is expected that the Academic Advisor and the student confer and make any changes before submitting the form to the HSIP Oversight Committee. The advisor's final comments are to be entered on the appropriate space on the form, and supporting materials (such as abstracts) attached, before the progress report is submitted as a packet to the HSIP Coordinator. *It is recommended that the review process be started sufficiently early, or at least one month in advance, to meet the June 15th deadline.*

The HSIP Oversight Committee reviews the progress of each student as recorded by the Academic Advisor and student. An email or letter will be sent to PhD students and their advisors indicating that their progress has been reviewed and, where appropriate, notating any recommendations regarding the adequacy of the progress, particularly of academic milestones. While the yearly review is required, the process does not in itself constitute a review that leads to academic sanctions. It is intended and viewed as a means of supporting PhD students in their effort to graduate in a timely manner and to achieve the milestones needed to be successful in their 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.

All forms are available in the Current Students section of the HSIP website.

2.12 Academic Advisor

The student's first year Academic Advisor is assigned by the HSIP Oversight Committee in conjunction with the Track Director and is an HSIP faculty member. Students are responsible for scheduling and planning meetings with their advisor and meeting advisor 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 appropriately documented on the PhD Program Plan form (available on the Current Students section of the HSIP website). Students are encouraged to meet with their advisor at least quarterly to discuss ongoing progress and formulate plans for acceptable academic progress. The Director and Associate Director are also available for advising. The Academic Advisor serves as the primary advisor until a Dissertation Chair is identified. If the form is updated, please send the Program Coordinator a copy.

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 (Dissertation Chair) and a committee.

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 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 acceptance of offer of admission:

- If not already established, student meets with Associate Director to discuss track selection.
- HSIP Coordinator emails regarding assigned Academic Advisor.
- Student corresponds with Academic Advisor prior to first term regarding course selection for Year 1 and potential research interests for future.

Year 1

Fall

- Student meets with Academic Advisor to discuss:
  - course planning
  - research interests
  - potential research assistantships or lab rotations
- Student should complete PhD Program Plan form (available on website) with Academic Advisor and submit to Program Coordinator.

Winter

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

Spring

- Student meets with Academic Advisor to discuss:
  - Annual PhD Progress Report and updated PhD Program Plan (submit by June 15)
  - course planning
  - qualifying exams
  - Year 2 funding
  - teaching experience plans/opportunities

Summer

- Student continues full-time enrollment to meet 2-year continuous residency requirement.
- Student meets with Academic Advisor to discuss:
  - qualifying exams
  - Year 2 funding
  - teaching experience plans/opportunities
- Revise and resubmit PhD Program Plan form as needed.
- HBMI students should have selected a Dissertation Advisor by this time, or should complete a lab rotation to facilitate that selection.

Year 2

Fall

- Student meets with Academic Advisor to discuss:
  - qualifying exams
  - review status of funding
  - teaching experience plans/opportunities
  - begin planning for dissertation
  - outstanding coursework

- Revise and resubmit PhD Program Plan form as needed.

Winter

- Student meets with Academic Advisor to discuss:
  - qualifying exams
  - review status of funding
  - teaching experience plans/opportunities
  - planning for dissertation (aim to identify the Dissertation Chair if not already done, and if possible, meet with the student to review the dissertation topic, committee, and proposal defense)
- Revise and resubmit PhD Program Plan form as needed.

Spring

- Student continues to meet with Dissertation Chair to discuss dissertation, committee selection, and proposal defense.
- Student meets with Academic Advisor to prepare Annual PhD Progress Report form and updated PhD Program Plan (submit by June 15) and discuss course selection if required.
- Once Dissertation Chair has been identified, meet with the student to review the dissertation topic, committee, and proposal defense.
- HBMI Students typically take their qualifying exam during this quarter and should not plan on classes during the quarter they are taking the exam. Students who need to take a course due to scheduling can work with the academic advisor to reschedule the qualifying exam.

Summer

- Student continues full-time course enrollment to meet 2-year continuous residency requirement.
- Once Dissertation Chair 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.
- Overview Committee will provide feedback on annual progress.

Year 3 [a]

Fall

- Student meets with Academic Advisor to review progress on dissertation proposal and status of funding.
- Student meets regularly with Dissertation Chair 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 Dissertation Chair.
- Revise and resubmit PhD Program Plan form as needed.

Spring

- Student works with Academic Advisor to complete Annual PhD Progress Report form and updated PhD Program Plan by June 15.
- Student defends dissertation proposal and incorporates feedback and revises as necessary, with assistance from Dissertation Chair.

Summer

- Student continues to meet regularly with Dissertation Chair.
- Overview Committee will provide feedback on annual progress.

Year 4 and beyond [a]

Fall

- Student continues to meet regularly with Dissertation Chair.

Winter

- Student continues to meet regularly with Dissertation Chair.

Spring

- Student completes Annual PhD Progress Report form and updated PhD Program Plan with Academic Advisor, submitting by June 15.
- Meets with Dissertation Chair to plan dissertation defense.
- Dissertation defense feedback is incorporated and dissertation is revised as necessary.

Summer

- Student continues to meet regularly with Dissertation Chair.
- Overview Committee will provide feedback on annual progress.

[a] Students 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 one and a half hours every other week for the first three quarters of the first year of study. The course is delivered using a hybrid approach that combines in-person and virtual class meetings.

3.1.2 Core Competencies

There are core competencies in which all HSIP students must take coursework. Track faculty may designate which course fulfills the competency for students in the track. A more advanced course can be substituted if the student already has completed the equivalent of an introductory course.

Core competency	Example Courses
Ethics	HSIP 400 Interdisciplinary Health Sciences Doctoral Colloquium
Informatics	
Communication	
Statistical Methodology	BIOSTAT 402 Intermediate Biostatistics
	PUB_HLTH 421 Intermediate Biostatistics
	HQS 440 Fundamental Methods in Healthcare Quality and Patient Safety
Research Design	BIOSTAT 301 Introduction to Epidemiology
	HSR 425 Introduction to Quantitative Methods in Health Services & Outcomes Research
	HSIP 441, 442, 443 Informatics Methods I, II, III
Measurement and Outcomes	HSIP 401 Introduction to Health Measurement Science
	HSIP 441, 442, 443 Informatics Methods I, II, III
Writing	PUB_HLTH 445 Writing and Peer Reviewing for Publication
	HSR 462 Grant Writing DGP 496-3 Introduction to Life Sciences/Grant Writing

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.

3.2 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 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 you are receiving stipend funding, register for 3 credits of HSIP 590.
3. If you are not receiving stipend funding, register for TGS 500. 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

During the second year, the student should prepare for comprehensive qualifying exams, with a goal of completing these exams during the second or third year. The plan for the exams will be developed in conjunction with the Academic Advisor. The HSIP model for qualifying exams will consist of a two-part exam.

Part 1) Track-specific

- Goal: Demonstrate knowledge, understanding, and proficiency in track-related content and methodology. Exam preparation should be related but not identical to student's dissertation topic. One of the purposes is to challenge students to discover relevant literature and deepen their knowledge of interests within track. HBMI student to obtain an A- or better in 441, 442 and 443 are considered to have completed this requirement.

Part 2) Integrated

- Goal: Demonstrate breadth of knowledge across health sciences disciplines through a task or question that requires synthesis of knowledge from HSIP core areas.

Students are expected to work independently during qualifying exams. Exceptions to this rule include (1) consultation with the Qualifying Exam Committee around clarifying questions, (2) assistance from Galter Library librarians, and (3) second coders/reviewers for systematic literature reviews or qualitative data analyses if they are allowed by the Qualifying Exam Committee. Students are allowed to use all relevant materials, including previously submitted grant proposals, as long as 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 not previously submitted grant proposals should consult their Qualifying Exam Committee.

General Structure of exam

1. Topics will be defined by the Exam Committee with student input.
2. Defining materials to be used for exam preparation: materials will depend on track-specific exam descriptions (see Appendix A for details).
    - Planning worksheets for both qualifying exams and proposal for the Integrated Exam (available on Current Students section of the website)
3. Preparation period:
    - Once planning forms have been approved, the student will have a defined amount of time to prepare for the exam. Timing should be agreed upon by the Exam Committee and HSIP Director.
4. Exam period:
    - Duration of the exam period should be agreed upon by the Exam Committee and HSIP Director. Typical durations are specified for each exam in Appendix A.
    - Each exam will involve an oral presentation and defense with the Exam Committee.

Timing

- The timing of exams is flexible depending on each student's requirements and course timing.
- It is anticipated that most HSIP students should be able to start preparing for exams in Year 2, with an aim to complete by Winter Quarter of Year 3 (this allows for revision by Spring of Year 3).
- TGS deadline for successfully passing qualifying exams is end of the student's 3rd year in the program. 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).
- Students can follow exam specifications from the Handbook on record at the time of matriculation to HSIP.
- Students also have the option of following subsequent (or newer) exam specifications at their discretion.

The Exam Committee, chosen by the student and the Academic Advisor and approved by the HSIP Director, will objectively evaluate the student's qualifications to enter PhD candidacy.

- Part 1) HSOR, HQS, and SSH students will have a Track-Specific Exam Committee (3 or more members): 2 or more faculty from student's track + HSIP Director or Associate Director. HMBI students will not require an Exam Committee for their track-specific exam.
- Part 2) Integrated Exam Committee (3 members): 1 from student's track + 1 from a related track + HSIP Director or Associate Director
    - For the Integrated Exam, the related track faculty member should be from a track that's the same or close to the secondary area identified by the student with guidance from HSIP Director or their designate.
- Each committee will choose a committee chair who will be in charge of communicating the committee's decisions and feedback with the student and the HSIP Program Coordinator. The committee chair will be the track leader unless the committee decides otherwise.

Grading: Committees will assign a grade of Pass, Conditional Pass, or Fail to the student's performance.

- If a Conditional Pass is given, then the Exam Committee will outline required changes and timeline for submission of changes.
- If a student fails an exam, the Exam Committee will determine the timing and requirements for revising and/or re-taking the exam. If the student fails the first submission of an exam, the student will have one opportunity to revise the exam in order to earn a Pass or Conditional Pass. If the resubmission of the exam is failing, the student will be given one opportunity to re-take the exam with a new topic in order to earn a Pass or Conditional Pass. Students will be limited to one re-take. Students who fail the exam after re-taking may be able to transfer to the relevant Master's degree if their grades and other academic performance are acceptable to that program's administration. Where possible, the HSIP administration will facilitate these transitions.
- The Exam Committee chair will contact the Program Coordinator with the results of all qualifying exams. Faculty will maintain confidentiality regarding the exam as required by FERPA regulations. Once the exam is complete, students are free to seek feedback on their written document from any source. The student and advisor are strongly encouraged to meet to discuss the exam and the report.

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 date 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 a medical or family leave, requiring that a petition for deadline extension be submitted to and approved by TGS.

Admission to candidacy is reached by passing comprehensive qualifying examinations and completing all coursework requirements. Specifications of the HSIP 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 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.

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 particular 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. Usually this section is 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).

3.2.6 Responsible Conduct of Research (RCR)

All graduate students and post-doctoral fellows (and some undergraduates) are now required to go through a program of RCR training. This is a requirement that comes from the National Science Foundation (NSF), so universities and departments that have any NSF funding must get their students RCR certified. As implemented at NU, there are two components to certification. Students will have to complete and pass a series of online CITI modules (like the human subjects training modules that people now go through before they can get IRB approval for research projects). Students also must complete a discussion component, which is to be designed by the department. We are offering three options for the discussion component:

- HSR 480: Ethical Issues in Health Service Research https://catalogs.northwestern.edu/tgs/health-services-outcomes-research/#coursestext
- PUB_HLTH 441: Ethical issues in Clinical Research https://catalogs.northwestern.edu/tgs/public-health/#coursestextTaking Responsibility for Responsible Conduct of Research (zero credit course offered through NUCATS): https://nucats.northwestern.edu/education-career-development/early-career-faculty-development-programs/taking-responsibility-responsible-conduct-research
- Taking the CITI module for RCR and scheduling discussion time with their Academic Advisor.

Please email the HSIP Coordinator to indicate which option you are taking.

3.3 Fourth Year of Study and Beyond

3.3.1 Publication

By the end of their PhD program, all students must have at least one first-authored article accepted for publication in a peer-reviewed journal or scientific forum. This paper does not need to stem from the student's dissertation research. Manuscripts can stem from the student's qualifying exam or research experiences while in the PhD program. The expectation for publication reflects the need for students to demonstrate their ability to produce scholarly output in order to be competitive in the job market after graduation.

- 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.

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:
     - What you found,
     - What it means to the broader field,
     - What unique contributions your study has made in terms of findings and novel methods, and
     - 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.
    - 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.
    - 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 will be supported (tuition and stipend) by a FSM Fellowship funded by FSM for the first six quarters. In subsequent quarters (7 and beyond), each department/center will support the students in their tracks through training grants, pre-doctoral fellowships, and research assistantships. Should the student's research mentor be unable to provide full support, funding is guaranteed by the Track or the University. Students are guaranteed full stipend and tuition for up to 5 years as long as they maintain academic performance and make progress towards their degree. Students on academic probation may still receive federal or institutional assistance for a limited amount of time (see section 5.2.6). This progress will be reviewed and monitored by the HSIP Oversight Committee annually as described in the section on 'Monitoring of progress towards the PhD.' Funding for a 6th year or beyond is contingent upon satisfactory progress toward the degree and the availability of funds.

It may be helpful to review the Graduate Funding section of the Graduate School website (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 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 Associate Director or Director.

Travel costs
The Health Sciences Integrated Program is able to support up to five HSIP students per year to attend special meetings and conferences related to the health sciences. Requests for funds will be taken on a first come first served basis, and will be considered based on proposals' relevance to the student's dissertation research and the support of the student's academic advisor or dissertation chair. Requests must be submitted in writing by completing the *Travel Fund Request Form* available on the Current Students section of the website.

4.2 Fellowships

The Department encourages eligible students to compete for fellowships, both internal (such as the prestigious Presidential Fellowship) and external. Externally funded fellowships often require institutional assurances. Students seeking externally funded fellowships or dissertation grants will be assisted by the IPHAM research administration team. Students should contact the HSIP Associate Director or Director several months before an external application is due in order to facilitate IPHAM research administration support. The HSIP Coordinator will announce fellowship opportunities on a rolling basis. Check links on the Current Students section of the HSIP website.

4.3 Working

Graduate students are expected to be full-time students conducting their studies and research. On occasion another funding opportunity may arise. When that situation occurs permission to receive remuneration must be requested.

A permission to work form is required when students are receiving additional pay if any of the following conditions are met:

- The graduate student's service exceeds 10 hours/week.
- The graduate student's period of service exceeds one month.
- 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 and submitted before the work begins.

For students engaged in work through a Research Assistantship, the expectation is that students will work a minimum of 20 hours per week and a maximum of 30 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 funding agency or training grant PI to determine how much work above and beyond training activities is permitted.

5 General policies and information

5.1 Master's Option in lieu of PhD Candidacy

The HSIP is a PhD training program. However, there are situations when pursuit of the PhD cannot be completed, and an option for a terminal master's degree will be provided. Eligible applicants for a master's degree are those who have successfully completed the required letter-graded graduate level courses and have done sufficient research to write a master's thesis as required but are unable to complete the PhD program requirements for personal or professional reasons. PhD students in good academic standing who wish to obtain a terminal master's degree will petition the HSIP Oversight Committee and the Director of HSIP explaining why they cannot complete the PhD program. In these cases, the respective track's master's program would have to agree to accept the student, and the student must still meet the master's requirements for that track.

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 513 (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 513.

- **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 The Graduate School 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 or not the student is making appropriate progress towards completion of the PhD. Students who fail to make adequate progress are subject to dismissal.

Academic Advisors and Dissertation Chair 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 Dissertation Chair 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 Dissertation Chair 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 Dissertation Chair

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, Dissertation Chair, 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

Harassment, whether verbal, physical, or visual, that is based on race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, parental status, marital status, age, disability, citizenship, or veteran status is a form of discrimination. Discrimination and harassment complaints should be referred to the Office of Equity.

The University's nondiscrimination policy is as follows:

Northwestern University does not discriminate or permit discrimination by any member of its community against any individual on the basis of race, color, religion, national origin, sex, pregnancy, sexual orientation, gender identity, gender expression, parental status, marital status, age, disability, citizenship status, veteran status, genetic information, reproductive health decision making, or any other classification protected by law in matters of admissions, employment, housing, or services or in the educational programs or activities it operates. Harassment, whether verbal, physical, or visual, that is based on any of these characteristics is a form of discrimination. Further prohibited by law is discrimination against any employee and/or job applicant who chooses to inquire about, discuss, or disclose their own compensation or the compensation of another employee or applicant.

Northwestern University complies with federal and state laws that prohibit discrimination based on the protected categories listed above, including Title IX of the Education Amendments of 1972. Title IX requires educational institutions, such as Northwestern, to prohibit discrimination based on sex (including sexual harassment) in the University's educational programs and activities, including in matters of employment and admissions. In addition, Northwestern provides reasonable accommodations to qualified applicants, students, and employees with disabilities and to individuals who are pregnant.

Any alleged violations of this policy or questions with respect to nondiscrimination or reasonable accommodations should be directed to Northwestern's Office of Equity, 1800 Sherman Avenue, Suite 4-500, Evanston, Illinois 60208, 847-467-6165, equity@northwestern.edu.

Questions specific to sex discrimination (including sexual misconduct and sexual harassment) should be directed to Northwestern's Title IX Coordinator in the Office of Equity, 1800 Sherman Avenue, Suite 4-500, Evanston, Illinois 60208, 847-467-6165, TitleIXCoordinator@northwestern.edu.

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 www2.ed.gov/about/offices/list/ocr/complaintintro.html or calling 800-421-3481. Inquiries about the application of Title IX to Northwestern may be referred to Northwestern's Title IX Coordinator, the United States Department of Education's Assistant Secretary for Civil Rights, or both.

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.

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, Seminars, and Journal Club

Students are expected to stay current on advances in their field and to participate in the general academic life of their track. This includes, but is not necessary limited to, attendance at relevant departmental seminars and active participation in journal clubs for all years is required. Each track will identify those activities that are expected of trainees. 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 regular meetings organized by the HSIP administrative team. These meetings typically occur on the Wednesdays 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
- Student-run journal club, which will allow students to take a leadership role by choosing an article and chairing the discussion. The journal club will also expose the students to areas of expertise beyond their own track and help them develop skills for multidisciplinary work in the future.
- 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.

Absences should be reported to the HSIP Coordinator.

All HBMI trainees are expected to participate in the noon Data Science and Informatics Tuesdays. This will include a journal club with presentations by students, attendance at talks, and presentations by senior students on ongoing research. The track will also schedule periodic student meetings to present track-related issue to students as well as to gain input from students. Students are also expect to participate in an annual Data Science and Informatics retreat. Absences should be reported to the HBMI track 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 The Graduate School
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. The form is located at 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.

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 Blackboard system, 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.

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 systematic review or meta-analysis on an HSOR topic related to (but not identical to) his or her dissertation topic. The paper should be planned, developed, and formatted for an HSR-specific journal, such as *Medical Care Research and Review*.

The student will submit 3 possible topics for the systematic review/meta-analysis to the committee, and the committee will chose the final topic.

Students will be given **8 weeks** to complete the systematic review. Students are encouraged to meet with Galter Library research librarian Linda O'Dwyer to plan their search strategy. A second coder is allowed with permission of the Committee.

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 systematic 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. 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.

A.1.2 Integrated Exam

The student will prepare a grant proposal that draws on knowledge across the tracks. The committee will prepare a Request for Proposal (RFP), and the student will be expected to respond within a specific timeframe, typically **8 weeks**. Typically students are expected to prepare a one-page Specific Aims and a six page Research Strategy.

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.

An example RFP

The Centers for Medicare and Medicaid Services (CMS) recently launched the Bundled Payments for Care Improvement (BPCI) initiative, under which CMS will make a single, prospectively determined bundled payment to hospitals that would encompass all services furnished during the inpatient stay by the hospital, physicians, and other practitioners. Participants can select up to 48 different clinical condition episodes (*http://innovation.cms.gov/initiatives/bundled-payments/*). CMS is accepting proposals for an evaluation of the BPCI initiative.

The specific research questions have been deliberately left open to allow respondents flexibility in formulating their proposals, but results of the evaluation should be practical for policy-making and contribute to the literature. Some of the general aspects that might be addressed include, but are not limited to, the following:

- Impact on special populations
- Financial impact for providers and CMS
- Implementation assessment
- Role of local context in the success or failure of individual participants, and general facilitators and barriers to success
- Patient and provider satisfaction
- Replicability of results nationally

All proposals should include the following:

- Clarification of and rationale for research questions
- Conceptual framework (i.e., theories, bodies of knowledge and concepts) that informs the evaluation design
- Description of the research design and analysis, including all data sources, and measurement of key variables. Examples of draft data collection instruments are expected.
- Description of the potential impact of findings, including value of the information for various stakeholders
- A timeline of activities

Proposals should be prepared using the AHRQ R36 “Research Strategy” instructions (Instructions are below).

Proposals will be evaluated based on:

- Significance of the research questions
- Technical merit of the evaluation approach
- Potential for findings to produce actionable findings for policy makers
- Quality and clarity of the written work

Applicants should assume that CMS will commit as many resources as needed to support the evaluation. Applicants should also assume that the evaluation and launch of the BPCI will occur simultaneously. The BPCI initiative will run for 5 years and the evaluation for 7 years. Applicants should assume a one-year lag in access to administrative data (i.e., Medicare claims) and data collected directly from participating hospitals and physician groups.

AHRQ R36 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 SIX PAGES. (not counting references)

(a) *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.

(b) *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.

(c) *Approach*

- Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. Unless addressed separately the Resource Sharing Plan, attachment include how the data will be collected, analyzed, and interpreted as well as any resource sharing plans as appropriate.
- Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.
- If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work.
- Point out any procedures, situations, or materials that may be hazardous to personnel and precautions to be exercised. A full discussion on the use of select agents should appear in the Select Agent Research attachment, below.

If an applicant has multiple Specific Aims, then the applicant 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.

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

- 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?
- Does the review reflect the current state of knowledge in sufficient detail?
- Does it clear identify the gap in knowledge that motivates the proposal?
- Is the proposed project technically and/or conceptually innovative?
- Are the proposed aims of the project feasible, properly controlled, and of reasonable scope?
- Is the proposal clearly written and carefully edited, and does it comply with the conventions of proposal writing?

A.2. Health & Biomedical Informatics

A.2.1 Track Specific Exam

Due to the fact that HBMI include 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 HSIP Qualifying Exam will occur in the spring of the second year and will follow the model of a mock grant proposal narrative. It will consist of:

(i) a written proposal that includes a comprehensive review of the present state of a student's chosen field of dissertation research and one substantive proposed experimental aim that addresses a key outstanding question in the field, and
(ii) an oral defense.

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 labs 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 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 application
4. The proposal seeks to demonstrate that the new tool or method is better than the old tool or method.

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, Patient Reported Outcomes, Health Finance, or Health Policy

To pass the exam, students must demonstrate:

1. A knowledge base suitable to the work they are proposing, including an intimate knowledge of their specific area of research as well as a working knowledge of their field as a whole.

2. An ability to formulate a testable hypothesis in an area of independent scholarship, outline a set of specific aims needed to test the hypothesis, propose reasonable approaches to achieve those aims.

The exam format aims to focus the student's productivity and ensure the academic rigor of the exam. Students will immerse themselves in their chosen field of research and the literature of this field while demonstrating an ability to propose original scholarship. The format provides students a structured mechanism through which to gain a mastery of the literature of their chosen field of research precisely when it can have the greatest potential to impact positively on their dissertation research. Completion of the Qualifying Exam will facilitate timely completion of the dissertation proposal, as the exam document will serve as an excellent basis for the dissertation proposal itself. It is expected that, in the dissertation proposal, greater emphasis will be placed on the experimental approaches and less on background knowledge.

There are several important features of this format:

• The Exam Committee must strive to objectively evaluate the student's qualifications to enter PhD candidacy. Committees will assign a grade of Pass, Fail, or Conditional Pass to the student's performance (see below).

• An exam chairperson will be named by the HSIP Director. The exam chairperson is charged with both coordinating the efforts of the committee in examining the student and writing the summary document. The committee will utilize a standard form to report their evaluation of the student's performance. These documents serve as a valuable source of feedback for both the student and their advisor.

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.

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.

Overview of Qualifying Exam requirements and expectations

Committee: Committee members will be drawn from the HSIP faculty at large, and each committee will consist of three members (not to include the student's research advisor/dissertation char). In addition to an exam chairperson, the committee will include one HBMI faculty knowledgeable in the student research domain and one member from another HSIP track.

Prior to submitting potential topics for the qualifying exam, students will submit to their Academic Advisor a one-page description of their intended dissertation project, including hypothesis and specific aims. This information will enable the Academic Advisor in conjunction with the Track Director to form an examining committee with expertise on the student's specific field of research.

The student will later submit a document to the exam chairperson with a description of three proposed topics for the qualifying exam. The total document may be up to 1.5 pages. The submitted topics should be ordered by student preference. The committee will approve one topic. If none of the proposed topics are acceptable, the committee may choose one of the proposed topics but indicate a slight modification or suggestion as to how to make it more different from the student's dissertation work. If the student finds this acceptable, he/she may proceed. He/she may also choose not to accept the modified topic and will then be given an additional three days to resubmit new topics. The committee will choose one of these within 4 days, and the student will then be given a one-week extension to complete the document. If the committee rejects both proposals, the student will be given an additional three days to resubmit new topics. The committee will choose one of these within 4 days, and the student will then be given a one-week extension to complete the document.

Approximate Timeline:

- March 1 (approximately) – Student submits summary (abstract and specific aims) of dissertation work to Academic Advisor.
- April 1 (approximately) – Topics submitted to the Exam Committee.
- April 7 (approximately) - Approved topics reported to student by Exam Committee.
- The student will have 4 weeks to complete the exam after a topic is selected.
- During this period, the student may ask procedural or clarifying questions of the Exam Committee Chair, but should otherwise work independently without the assistance of others.
- Written documents will be submitted to the exam chairperson who will make them available to the Exam Committee.
- An oral presentation will be scheduled approximately 2 weeks after submission of the written exam document

The precise timeline will be communicated in advance to students and faculty by the exam chairperson. *The implication of this timing is that students should avoid courses during the Spring Quarter of Year 2. If a student has a compelling need to take a course during the Spring Quarter, they may petition to have the examination moved to Summer Quarter.*

Written Document

A. Length requirements: The document will follow NIH grant formatting standards. The document shall not exceed 11 pages, single-spaced, including figures but excluding references. The document will follow standard NIH formatting for margins and font. It is expected to describe **approximately 2 years worth of work (e.g. R21 or R03)**. One of the 11 pages will be a Specific Aims page.

B. Abstract and Specific Aims: The Abstract should succinctly describe the general area of study, the main question(s) addressed in the experimental aim, the rationale behind the choice of this experimental approach, the approach, and the significance of the study. This page will also indicate the hypothesis and specific aims of the proposal.

C. Comprehensive review: This section of the document should constitute approximately one-third to one-half of the entire text of the document (<6 pages). The review should outline the present state of knowledge in the field, preferably with some historical perspective for how the field arrived at this point, and identify key outstanding questions in the field.

Towards the end of this section, the student should focus the reader's attention around one key question (the one addressed in the proposed aim), and the student should put forward a thesis – an unproved statement – as a premise for the proposed experimental aim that addresses this question. In this section, the student should also detail the logic and rationale behind their choice of the question on which to focus (justification/significance). This discussion should be made in the context of the preceding points raised in the review and will thus serve to transition the reader's attention from the review section of the document to the experimental section.

D. Experimental Aim Section: This section should be roughly one-half to two-thirds of the written document (>6 pages). As noted, the detailed experiments should be organized around a clearly stated dissertation. Although the precise format of this section can vary, students should discuss the rationale/logic behind each major aim/subaim (Why are you doing this experiment? What do you hope to learn from it? Why is this important to know?), the experimental or methodological approach, expected/anticipated results, interpretations, conclusions and significance thereof, potential pitfalls, and alternative approaches. Students are encouraged to focus attention on developing a well-argued rationale for each aim/subaim, as this is an area often found lacking. Please note that there is no need for preliminary data.

E. To ensure in-depth knowledge in the proposed field of research, *students are required to read at least 50 of the most important papers in the field of interest as a necessary antecedent to writing the paper.* When such papers are referenced within the text of the written document they should be explicitly identified as such in the bibliography section of the paper; when such papers are not referenced in the document (as may occur in some cases), they should be placed in a distinct reference list immediately following the bibliography.

Once submitted, all qualifying exam documents will be analyzed by the Exam Committee (using software available in Canvas or other sources) for plagiarism.

Oral Presentation of the written document (20-25 minutes by the student). This section of the exam should generally follow the outline of the written document.

A. Introduction – focus audience's attention on the broad/general question(s) early in the talk.
B. Provide strong and polished overview of the present state of the field of interest while emphasizing significance/importance of this research.
C. Identify key questions in field and explain rationale behind focusing on a specific question.
D. State your thesis.
E. Explain your experimental approach, expected results, etc.

Committee Questioning: The Committee may ask questions throughout the talk but will generally save questions until the end. Questions will focus both on a student's knowledge of the general field of study as well as the specific experiments proposed.

Committee Conference: After questioning has concluded, the student will be asked to leave the room and the committee will confer in order to decide whether the student has demonstrated sufficient knowledge in the general area of research and of the proposed experiments.

Expectations

A. The document should be the best paper written to date in a student's academic career. It is also possible that in some cases the document can be converted into a short review article for a journal.

B. The questioning in the exam is expected to be rigorous because the area of study is the student's chosen field of dissertation research and thus the student should be the expert in the room on the subject.

Evaluation of Performance

The HSIP Qualifying Exam evaluation system allows the committee to provide detailed and direct feedback to the student and advisor. All comments will be summarized by the exam chairperson and provided to the student and the Academic Advisor following the exam. A copy of this report will also be forwarded to the HSIP Director. The evaluation, as recorded on the form, will address the criteria below.

Criteria for Grading the Written Examination

Comprehensive review

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 clear identify the gap in knowledge that motivates the proposal?

Experimental Aim

Is there a clearly stated and acceptable hypothesis?
Do the proposed experiments adequately test the hypothesis?
Does each of the experiments have a rationale?
Are the proposed experiments feasible, properly controlled, and of reasonable scope?
Are the experiments prioritized and do they follow a logical progression?
Are the experiments descried in sufficient detail to demonstrate adequate mastery of the research area?
Does the proposal predict all potential outcomes of the experiments and are alternative experimental approaches proposed when necessary?
Are the experiments merely descriptive or do they address mechanism?

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

General

Does the student possess a fund of knowledge, both specific and general, that would be expected of a graduate student who has completed the first two years of classes in the student's chosen field?
Is the student able to modify the proposal in light of criticisms and suggestions of the committee?

Comprehensive Review

Is the student familiar with and able to critically evaluate the pertinent literature?
Does the student have an appreciation of how the proposal relates to current state of the field? Is there a convincing argument that the proposal is technically and/or conceptually innovative?
Is the student able to answer questions about the literature that demonstrate that they understand the critical issues in the domain?

Experimental Aim

Is the student able to clearly state an acceptable hypothesis?
Is the student able to describe experiments that adequately test the hypothesis?
Does the student understand the rationale for each of the proposed experiments?
Does the student understand the technical aspects of the proposed experiments as well as their feasibility and scope?
Is the student able to design appropriate controls?
Is the student able to anticipate the outcomes of the experiments and design alternative experimental approaches when appropriate?

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?

Possible Qualifying Exam Outcomes

Based on both the written proposal and the oral defense of the written proposal, the qualifying exam committee will assign one of these three outcomes: pass, conditional pass, or fail.

• A grade of ***Pass*** means no additional work is required and indicates that the student has:

1) written and defended a proposal that meets the criteria described above;

2) mastered sufficient skills in experimental design, scientific writing, and public speaking such that further examination is not required;

3) demonstrated sufficient knowledge in both the narrow and broad fields of their research.

In this case, the committee will recommend that the student be admitted to candidacy.

• 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 conditional pass 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 proposal, oral defense, 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. 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 dismissal.

If a student's appeal is granted, the student must pass the Qualifying Exam outright on the second attempt. The second exam document will be written on the student's other submitted topic, if that topic was originally approved by the committee. If the topic was not approved, the student will submit two new topics for approval. If the failure is due to a determination of plagiarism, the student may be asked to submit new topics. The examining committee for the second exam should consist of the original chair plus one original member, a new member to be named by the HSIP. In addition, the exam will be monitored by a member of the Program Committee.

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.

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)
    - Description of what was done
    - A critique of key decisions
- The team, which should include:
    - Strategic decisions for engagement
    - 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:
    - Description of what was done
    - A critique of key decisions
    - 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
    - Research Design
    - Study Population

    - Data Collection
    - Analyses
    - 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.

There are four categories of evaluation for the case study:

- Pass – Based on the high quality of the written document and the student's presentation
- Pass with Minor Revisions – generally the student should incorporate the feedback
- 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 whole Committee, as determined by the Committee at the end of the Oral Defense. The Committee may also ask the student to present the revised work again orally to the Committee.
- Fail – Did not demonstrate or meet minimum standards of successful academic performance

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.

There are four categories of evaluation for the Integrated Exam:

- Pass – Based on the high quality of the written document and the student's presentation
- Pass with Minor Revisions – generally the student should incorporate the feedback
- 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 whole Committee, as determined by the Committee at the end of the Oral Defense. The Committee may also ask the student to present the revised work again orally to the Committee.
- Fail – Did not demonstrate or meet minimum standards of successful academic performance

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 prepare a grant proposal in the area of Social Sciences and Health in response to an RFP developed by exam committee and following the format of an NIH R21 or R03 proposal, suitable for submission to relevant funder. The student will submit 3 possible topics for the grant proposal to the Exam Committee. Decision on grant topic and format (e.g., R21, R03) will be made in discussion with the Exam Committee. Students will be given **8 weeks** to complete the proposal.

All proposals should include the following:

- Clarification of and rationale for research questions
- Conceptual framework (i.e., theories, bodies of knowledge and concepts) that informs the research design
- Description of the research design and analysis, including all data sources, and measurement of key variables. Examples of draft data collection instruments are expected.
- Description of the potential impact of findings, including value of the information for various stakeholders
- A timeline of activities

Oral Presentation of the written document (20-25 minutes by the student). This section of the exam should generally follow the outline of the written document.

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

- 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?
- Does the review reflect the current state of knowledge in sufficient detail?
- Does it clear identify the gap in knowledge that motivates the proposal?
- Is the proposed project technically and/or conceptually innovative?
- Are the proposed aims of the project feasible, properly controlled, and of reasonable scope?
- Is the proposal clearly written and carefully edited, and does it comply with the conventions of proposal writing?

A.4.2 Integrated Exam

The student will develop a systematic review or meta-analysis on a topic that integrates Social Science and Health and one of the other HSIP tracks (HSOR, HQPS, or HBMI). The topic can be related (but not identical) to their dissertation topic. The paper should be planned, developed, and formatted for a Social Sciences and Health-specific journal, such as *Social Science and Medicine*. The student will submit 3 possible topics for the systematic review/meta-analysis to the committee, and the committee will chose the final topic. A second coder is allowed with the permission of the Committee.

Students will be given **8 weeks** to complete the systematic review. 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 (20-25 minutes by the student). This section of the exam should generally follow the outline of the written document.

Evaluation of Performance

To earn a grade of "Pass," the systematic 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. The review should be formatted according Instructions for Authors for a suitable journal, given the topic of the review. 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;
- Conclusions and implications; and

- Writing quality, clarity, and style, and the organization of the information presented.