

Department of  
EPIDEMIOLOGY AND BIOSTATISTICS



# GRADUATE HANDBOOK

2023-2024

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## I. MASTER OF SCIENCE (MS) IN EPIDEMIOLOGY — DEGREE REQUIREMENTS

### 1. Course Requirements

The Epidemiology MS Degree requires 40 credit hours, of which no more than six (6) credits may be at the 400-level. The remaining credits must be in 800-level or higher graduate courses.

#### Required: Core Epidemiology (19 Credits)

EPI 810 Introductory Epidemiology	3
EPI 812 Foundations of Population Health	3
EPI 817 Epidemiology of Communicable Diseases	3
EPI 829 Principles and Methods of Epidemiologic Study Design	3
EPI 836 Practicum in Epidemiological Methods	3
{ EPI 815 Epidemiology of Cardiovascular Disease, or }	3
{ EPI 823 Cancer Epidemiology }	
EPI 828 Seminar in Responsible Conduct of Research <b>AND</b>	1
ALL Graduate School sessions in Responsible Conduct of Research series - non-credit	

#### Required: Core Biostatistics (9 Credits)

EPI 808 Biostatistics I	3
EPI 809 Biostatistics II	3
EPI 826 Research Methods in Epidemiology	3

#### Required: SAS (2 Credits)

EPI 851 SAS programming I: Essentials	1
EPI 852 SAS programming II: Data Management and Analysis.	1

#### Electives: (6 Credits)

EPI 805 Readings in the Historical Roots of Epidemiological Thought	
EPI 815 Epidemiology of Cardiovascular Disease	
EPI 816 Perinatal Epidemiology	
EPI 819 Spatial Epidemiology and Medical Geography	
EPI 823 Cancer Epidemiology	
EPI 835 Neuroepidemiology	
STT 847 Analysis of Survival Data	
EPI 890 Independent Study* (see below)	
EPI 910 Themes in Contemporary Epidemiology	
EPI 920 Advanced Methods in Epidemiology and Applied Statistics	
EPI 950 Advanced Biostatistical Methods in Epidemiology	
EPI 951 Latent Variable Modeling	
EPI 952 Duration and Severity Analysis	
EPI 953 Analytic Strategies for Observational Studies	
EPI 977 Social Epidemiology	
EPI 979 Advanced Topics Infectious Disease Epidemiology	

#### EPI 899 Master's Thesis Research\*\* (4 Credits)

A minimum of 4 credits is required and a maximum of 36 credits is allowable.

Courses from outside the department (MSU or elsewhere) may also be used after approval by your Advisor and the Graduate Program Director.

*\*Independent Study Credits:*

A maximum of **three (3) credits** can be earned through Independent Study and credited as electives in the MS program. You may take Independent Study credits by making appropriate arrangements with a faculty member, completing the Application for Independent Study Form at <https://epibio.msu.edu/students/>, and registering for EPI 890.

\*\* MS thesis credits can't substitute for EPI course credits. **For PhD-only students:** four (4) thesis credits are waived for students admitted directly into the PhD program without a prior MS degree. In lieu of thesis credits you will be required to submit a publishable quality paper, first approved by your Advisor then by the Graduate Program Director.

**Scientific Integrity:** All Epidemiology MS students must complete the entire set of MSU Graduate School workshops on Responsible Conduct of Research (RCR) and earn the Certificate of Completion (<https://grad.msu.edu/rcr/>). All students must also enroll in EPI 828 (1 credit), and complete the necessary online MSU Institutional Review Board (IRB) training if the thesis work requires MSU IRB approval (<https://www.humanresearch.msu.edu>).

## 2. Academic Standards

- a. The minimum cumulative grade-point average (GPA) required for graduation is 3.0. This is an MSU and departmental rule. [MSU RO: Academics](#) (see "Academic Standards")

In any given semester, a minimum 3.0 GPA is required.

In any given semester, a minimum grade of 2.5 in a **core** or **elective** course must be achieved.

- If your grade in a **core** course is below 2.5, you must retake the core course at the next available time offered and receive a grade of 3.0 or better.
  - If your grade in an **elective** course is below 2.5, you can either replace the elective course, or retake the course, at the next available time and must receive a grade of 3.0 or better.
  - No more than one retake is allowed per **core** or **elective** course.
  - No more than two **core** and two **elective** courses may be retaken/replaced during the degree program.
  - If you receive two (2) course grades (**core** or **elective**) of 2.0 or below your record will be reviewed by the Graduate Program Committee (GPC).
- b. If you fail to meet minimum standards your record will be reviewed by the Department's GPC and may result in your removal from the program.

## 3. Course Equivalency/transfer credit approval process

**IF** you completed graduate-level courses prior to entering MSU's MS Epidemiology program, **AND** those courses match existing courses in our MS curriculum, you may request:

- a) a transfer of credits and b) exemption from a course requirement.

Both requests require the Course Equivalency Form approval process (<https://epibio.msu.edu/students/>). You should make these requests early in your MS program.

- a. Transfer Credits: You may transfer a **maximum of nine (9) credits** from prior graduate-level, matching courses. Thus, your 40-credit MS requirement (and tuition) could be reduced to 31 credits.

- b. **Course Equivalency:** If a prior graduate-level course is approved as equivalent to a required MS course, you will be exempted from the required course. *You will still need to fulfill your total MS credit requirement.*

For both transfer of credits and course equivalency approvals, your prior courses must be approved as equivalent to MSU courses by your: 1) Advisor, 2) Instructor of the potential equivalent departmental course(s), and 3) Graduate Program Director (GPD).

#### **4. Time Limits**

From initial enrollment, you have six (6) years to complete all requirements for the MS degree. It is your responsibility as the student to monitor your progress in this timeframe.

#### **5. Student Progress**

- a) Find student forms at <https://epibio.msu.edu/students/>
- b) Update your Course of Study Worksheet at the end of each semester
- c) Update your MS Progress Form as you progress on thesis activities
- d) Obtain signature approvals on these forms from your Advisor and thesis Committee, and file these forms with the Academic Coordinator.

**Annual Review:** Timely completion of these progress forms helps your Advisor prepare for your annual review at the end of spring semester each year.

#### **6. Advisor and Thesis Committee**

##### **A. Advisor**

An Advisor is assigned at the beginning of your first year. It is your responsibility to schedule regular meetings with your Advisor to review your progress. Ordinarily, your Advisor becomes your MS thesis Advisor and your thesis Committee Chair. Under certain conditions it may be appropriate to arrange for a different MS thesis Advisor, with approval of both your original and potential new Advisor and the GPD.

##### **B. Thesis Committee**

Chair: Your thesis Committee Chair is ordinarily a tenure-track or tenured faculty member in the Department of Epidemiology and Biostatistics. Any other MSU faculty member can serve as your Committee Chair with the approval of the Department Chair and The Graduate School.

Committee Members: Your thesis Advisor will work with you to select a thesis Committee consisting of your thesis Advisor plus at least two (2) additional tenure-track faculty members (or any other MSU faculty members subject to The Graduate School approval). One of the two additional faculty members must also be from the Department of Epidemiology and Biostatistics. It is strongly recommended that at least one of the Committee members has expertise in biostatistics and one has expertise in epidemiology. A faculty member from another university may be called upon to serve as a Committee member.

Note: MSU-tenure track and tenured faculty are pre-approved by the Graduate School to potentially serve as Committee members. All others from inside or outside MSU can only be approved after the department Academic Coordinator (AC) applies to the Graduate School on your behalf. This process can take considerable time; you are encouraged to work closely with the AC to obtain approval before Committee activity is anticipated.

#### Timeline recommendations

- 1) Meet with your thesis Advisor at least once a month while working on your thesis.
- 2) Work with your thesis Committee to finalize your thesis topic. You must submit for approval the composition of your Committee in the Student Information System (SIS) ([www.student.msu.edu](http://www.student.msu.edu)).
- 3) By the end of your second semester meet with your thesis Committee, and discuss the scope of your work before Committee members sign the "Approval of Thesis proposal topic" section of the MS Progress Form.
- 4) Continue to meet with your thesis Committee to discuss your progress.

## 7. Thesis Requirements

### A. Master's Thesis Content/Format

The purpose of the Master's Thesis is to give you the opportunity to synthesize and apply your Epidemiology training to a health issue of your choice. Our faculty have identified four thesis formats which are acceptable for an epidemiology master's degree. An outline of the tasks involved in each format is provided below. The scope of work statement on the MS Progress Form should reflect the intended format of the thesis. The MS thesis should be substantial enough to yield one publishable scientific article in a relevant peer-reviewed journal or a grant proposal worthy of submission to a funding agency.

#### Four suggested thesis formats:

1. Descriptive Epidemiology of a disease or condition, or a hypothesis testing study, using **original** data collection and analysis.

- A. Identify topic of interest/hypothesis to be tested
- B. Identify study population
- C. Develop/test data collection instrument(s) for reliability and validity
- D. Original data collection
- E. Data entry and cleaning
- F. Analysis
- G. Identify strength/limitations of these data
- H. Write up thesis

2. Descriptive Epidemiology of a disease or condition, or a hypothesis testing study, based on the analysis of an **existing** data set.

- A. Identify topic of interest/hypothesis to be tested
- B. Identify existing data set
- C. Assess reliability/validity of data collection instruments and methods
- D. Data entry and cleaning
- E. Analysis
- F. Identify strength/limitations of these data
- G. Write up thesis

3. Design of a hypothesis testing study following an NIH grant proposal format such as:

- A. Objectives
- B. Specific Aims
- C. Background/Significance
- D. Preliminary Studies/Progress Report
- E. Research Design and Methods



- F. Proposed Analysis and Presentation Tables/Figures
- G. Write up thesis in the above format A – F

4. Critical review of the literature/meta-analysis, which is of publication quality.

- A. Identify topic/hypothesis
- B. Identify source articles
- C. Evaluate quality of the studies
- D. Conduct qualitative/quantitative review
- E. Summarize conclusions
- F. Write-up thesis

*Examples of prior theses are available in the Academic Coordinator's office and online at the MSU Library (<https://d.lib.msu.edu/etd/programs>).*

## **B. Human Subjects Protection for Master's Thesis**

See <https://hrpp.msu.edu/help/graduate-student.html> (graduate student research at MSU).

If you are undertaking human subjects research, you must complete MSU's online IRB training (<https://hrpp.msu.edu/training/index.html>). When applicable, your thesis proposal should be submitted for approval to the MSU Human Research Protection Program or the corresponding animal safety committee, when the research requires use of data from or contact with human participants or animal subjects. In some instances, if you are working on data from an ongoing research project with Institutional Review Board (IRB) approval, you will need to apply to the IRB. Your IRB approval letter is required by the Graduate School at the time of final submission of your thesis.

## **C. MS Thesis Defense**

1. You must be enrolled for at least one credit at the time of your defense.
2. Committee members must sign "Approval to Defend" section on the MS Progress Form.
3. Per MSU policy, all thesis defenses are open to the public. All department faculty and students are invited and encouraged to attend.
4. At least two weeks prior to your defense: in consultation with your adviser, you shall appoint a department faculty member who is not on your committee to serve as an External Examiner (**EE**) at your defense. At least one week prior to defense, send EE an electronic copy of your thesis. The role of the EE is to ensure a fair process by observing and contributing to the defense. The EE will have no vote.
5. Your thesis defense is scheduled to last approximately two hours, progressing through the following stages:
  - a. Committee Chair introduces all Committee members (including EE);
  - b. Student oral presentation (30 - 45 minutes);
  - c. Question/answer session open to the public;
  - d. Question/answer session with student and Committee members only;
  - e. After your temporary dismissal from the room, Committee has private deliberation and subsequent vote on your defense;
  - f. You reunite with Committee, and are informed of the Committee's decision;
  - g. Committee Chair leads a discussion regarding revisions (if any), and expected timelines for receiving revisions and final sign-off of the thesis.

#### D. Thesis Evaluation and Final Acceptance

One of the following outcomes is assigned by the Thesis Committee after the defense:

- a. Acceptable as is.
- b. Acceptable with minor revisions.
- c. Acceptable with major revisions.
- d. Unacceptable.

You will be informed about the procedure for evaluating and accepting the revisions. For example, the Committee may turn the evaluation task over to the Thesis Committee Chair or may delegate the authority to another committee member or members. Following the thesis defense, all Committee members must sign and date the "Thesis Sign off" section of the MS Progress Form; submit this form to the Academic Coordinator. Revisions will be specified on the form. Your thesis Committee Chair must sign the form indicating approval of all revisions. Only then will you be eligible for graduation. You do not need to be enrolled when completing revisions or applying for graduation. If the final defense is not successful, you have one more opportunity to make corrections and to defend successfully.

#### 8. Masters Student Timeline

Before first semester:

- a. Meet with your Advisor to discuss your coursework plan and research interests.
- b. Initiate course equivalency/credit transfer approval process.

Within first two semesters:

- c. Meet with your Advisor to define the scope of your thesis and identify a thesis Committee. Meet with your thesis Committee to provide brief overview of thesis.

Third semester onwards:

- d. Complete MS proposal approval section on the MS Progress Form and provide to the Academic Coordinator.
- e. Meet with your thesis Advisor and Committee as needed to complete the thesis and to report on coursework progress.

Preparing for thesis defense and defense (open to public, described above):

- f. The full Committee needs to agree your thesis is defensible (recommended 6-8 weeks before defense date).
- g. You must be enrolled for at least one credit at the time of your defense.
- h. The final draft of your thesis **MUST** be submitted to each Committee member at least 2 weeks before your defense date (preferably 4 weeks). Your Thesis Advisor and/or Committee members may require more time to review your thesis.
- i. Notify the Academic Coordinator at least 2 weeks before your thesis defense to allow time to schedule and publicize your defense.
- j. Thesis sign-off: Present the MS Progress Form to your Committee at your defense in-person, or electronically after the defense, and submit to the Academic Coordinator.

After thesis defense:

- k. Complete any specified revisions as soon as possible. You will not receive your Masters degree until revisions are completed, your Thesis Committee Chair has signed-off, and your thesis has been submitted to the Graduate School.
- l. Submit **electronic** thesis and any required IRB approval letter to the Graduate School.
- m. Submit one **print** copy of your thesis to the Academic Coordinator.
- n. All requirements of your Masters Program must be completed within 6 years.

## II. MASTER OF SCIENCE (MS) IN BIOSTATISTICS — DEGREE REQUIREMENTS

### 1. Course Requirements

The program is available under either Plan A (with thesis) or Plan B (Capstone project, without thesis). Plan A or B requires a total of 33 credits, with no more than 6 credits at the 400-level.

#### Required: Core Biostatistics and Epidemiology (14 Credits)

EPI 808B Advanced Biostatistics	3
EPI 810 Introductory Epidemiology	3
EPI 826B Categorical Data Analysis	3
EPI 856 Statistical Consulting in Public Health	1
EPI 828 Seminar in Responsible Conduct of Research <b>AND</b> ALL Graduate School sessions in Responsible Conduct of Research series - non-credit	1

#### Choose one of these two courses (3 credits):

{EPI 853B Statistical Computing <b>OR</b> STT 802 Statistical Computation}	3
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#### Electives: Biostatistics, Statistics, Econometrics (12 Credits for Plan A; 15 Credits for Plan B)

EC 821A Cross Section and Panel Data Econometrics I	3
EC 821B Cross Section and Panel Data Econometrics II	3
EPI 851 SAS Programming I: Essentials	1
EPI 852 SAS Programming II: Data Management & Analysis	1
EPI 855 Biostatistical Modeling in Genomic Data Analysis	3
EPI 858 Clinical Trials	3
EPI 951 Latent Variable Modeling	3
EPI 952 Duration and Severity Analysis	3
EPI 953 Analytic Strategies for Observational Studies	3
FOR 875 R Programming for Data Sciences	3
STT 464 Statistics for Biologists	3
STT 465 Bayesian Statistical Methods	3
STT 801 Design of Experiments	3
STT 814 Advanced Statistics for Biologists	4
STT 825 Sample Surveys	3
STT 847 Analysis of Survival Data	3
STT 861 Theory of Probability and Statistics I	3
STT 862 Theory of Probability and Statistics II	3

*Additional elective courses may be chosen with approval of your Advisor*

#### Electives: Epidemiology (3 Credits)

EPI 805 Readings in the Historical Roots of Epidemiological Thought	3
EPI 815 Epidemiology of Cardiovascular Disease	3
EPI 816 Perinatal Epidemiology	3
EPI 817 Epidemiology of Communicable Diseases	3
EPI 819 Spatial Epidemiology and Medical Geography	3
EPI 823 Cancer Epidemiology	3
EPI 829 Principles and Methods of Epidemiologic Study Design	3
EPI 835 Neuroepidemiology	3
EPI 890 Independent Study in Epidemiology and Biostatistics	1-3*
EPI 910 Themes in Contemporary Epidemiology	3
EPI 977 Social Epidemiology	3
EPI 979 Advanced Topics in Infectious Disease Epidemiology	3

Courses from outside the department (MSU or elsewhere) may also be used after approval by your Advisor and the Graduate Program Director.

Required: Plan B only (1 credit)

EPI 890 Independent Study-Capstone Project 1

Required: Plan A only (4 credits)

EPI 899 Master's Thesis Research 4

A minimum of 4 credits is required and a maximum of 36 credits is allowable.

*\*Independent Study Credits:*

A maximum of **three (3) credits** can be earned through Independent Study and credited as electives in the MS program. You may take Independent Study credits by making appropriate arrangements with a faculty member, completing the Application for Independent Study Form at <https://epibio.msu.edu/students/>, and registering for EPI 890.

**Scientific Integrity:** All Biostatistics MS students must complete the entire set of MSU Graduate School workshops on Responsible Conduct of Research (RCR) and earn the Certificate of Completion (<https://grad.msu.edu/rcr/>). You must also enroll in EPI 828 (1 credit), and complete the necessary online MSU Institutional Review Board (IRB) training if the thesis work requires MSU IRB approval (<https://www.humanresearch.msu.edu>).

## 2. Academic Standards

- c. The minimum cumulative grade-point average (GPA) required for graduation is 3.0. This is an MSU and departmental rule. [MSU RO: Academics](#) (see "Academic Standards")

In any given semester, a minimum 3.0 GPA is required.

In any given semester, a minimum grade of 2.5 in a **core** or **elective** course must be achieved.

- If your grade in a **core** course is below 2.5, you must retake the core course at the next available time offered and receive a grade of 3.0 or better.
  - If your grade in an **elective** course is below 2.5, you can either replace the elective course, or retake the course, at the next available time and must receive a grade of 3.0 or better.
  - No more than one retake is allowed per **core** or **elective** course.
  - No more than two **core** and two **elective** courses may be retaken/replaced during the degree program.
  - If you receive two (2) course grades (**core** or **elective**) of 2.0 or below your record will be reviewed by the Graduate Program Committee (GPC).
- d. If you fail to meet minimum standards your record will be reviewed by the Department's GPC and may result in your removal from the program.

## 3. Course Equivalency/Transfer Credit approval process

**IF** you completed graduate-level courses prior to entering MSU's MS Biostatistics program, **AND** those courses match existing courses in our MS curriculum, you may request:

a) a transfer of credits and b) exemption from a course requirement.

Both of these requests require the Course Equivalency Form approval process

(<https://epibio.msu.edu/students/>). You should make these requests early in your MS program.

- a. Transfer Credits: You may transfer a **maximum of nine** (9) credits from prior graduate-level, matching courses. Thus, your 33-credit MS requirement (and tuition) could be reduced to 24 credits.
- b. Course Equivalency: If a prior graduate-level course is approved as equivalent to a required MS course, you will be exempted from the required course. *You will still need to fulfill your total MS credit requirement.*

For both transfer of credits and course equivalency approvals, your prior courses must be approved as equivalent to MSU courses by your: 1) Advisor, 2) Instructor of the potential equivalent departmental course(s), and 3) Graduate Program Director (GPD).

#### 4. Time Limits

From initial enrollment, you have six (6) years to complete all requirements for the MS degree. It is your responsibility as the student to monitor your progress in this timeframe.

#### 5. Student Progress

- a) Find student forms at <https://epibio.msu.edu/students/>
- b) Update your Course of Study Worksheet at the end of each semester
- c) Update your MS Progress Form as you progress on capstone or thesis activities
- d) Obtain signature approvals on these forms from your Advisor and thesis Committee, and file these forms with the Academic Coordinator.

**Annual Review:** Timely completion of these progress forms helps your Advisor prepare for your annual review at the end of spring semester each year.

#### 6. Plan B Independent Study - Capstone Project

- a. As an MS candidate, you will register for 1 credit of Independent Study under EPI 890. You will meet with your academic Advisor and identify at least one faculty member in the Department of Epidemiology and Biostatistics who may be a potential match to form a committee to direct your "Project". Once an agreement is reached, you and your Committee (usually 2-3 members) will work together with the goal of completing your Project by the last semester of the MS program.
- b. Capstone Project will be accomplished in one of the following formats:
  - 1. An expanded exploration of a topic or a statistical method/model from one of the required or elective biostatistics courses through simulation or systematic review.
  - 2. A statistical analysis of an extant data set. It should include a discussion and application of methods, tables and figures as appropriate, and a summary of the findings.
  - 3. A statistical analysis plan (SAP) for a clinical trial or a hypothetical proposal of the research advisor's choice
- c. The end product will consist of a short written report summarizing your Project, 10-15 pages in length, reviewed by your Committee. In consultation with your thesis Advisor, you shall appoint a faculty member from the Department, who is not a thesis Committee member, to serve as an External Examiner (**EE**) at the defense. You will be asked to present and defend your Project under the following format:
  - a. Committee Chair introduces all Committee members (including EE);
  - b. Student oral presentation (15 - 20 minutes);



- c. Question/answer session open to the public;
- d. Question/answer session with student and Committee members only;
- e. After your temporary dismissal from the room, Committee has private deliberation and subsequent vote on your project defense;
- f. You reunite with Committee, and are informed of the Committee's decision;
- g. If Committee agrees you have passed the defense, the Plan B form sign-off is signed and dated by each Committee member.
- h. If Committee Chair leads a discussion regarding revisions, you can expect timelines for receiving revisions and final sign-off of the Capstone project.

## **7. Plan A Master's thesis - Advisor and Thesis Committee**

### **A. Advisor**

An Advisor is assigned at the beginning of your first year. It is your responsibility to schedule regular meetings with your Advisor to review your progress. Ordinarily, your Advisor becomes your MS thesis Advisor and your thesis Committee Chair. Under certain conditions it may be appropriate to arrange for a different MS thesis Advisor, with approval of both your original and potential new advisor and the GPD.

### **B. Thesis Committee (Plan A only)**

Chair: Your thesis Committee Chair is ordinarily a tenure-track or tenured faculty member in the Department of Epidemiology and Biostatistics. Any other MSU faculty member can serve as your Committee Chair with the approval of the Department Chair and The Graduate School.

Committee Members: Your thesis Advisor will work with you to select a thesis Committee consisting of your thesis Advisor plus at least two (2) additional tenure-track faculty members (or any other MSU faculty members subject to The Graduate School approval). One of the two additional faculty members must also be from the Department of Epidemiology and Biostatistics. It is strongly recommended that at least one of the Committee members has expertise in biostatistics and one has expertise in epidemiology. A faculty member from another university may be called upon to serve as a Committee member.

Note: MSU tenure-track and tenured faculty are pre-approved by the Graduate School to potentially serve as Committee members. All others from inside or outside MSU can only be approved after the department Academic Coordinator (AC) applies to The Graduate School on your behalf. This process can take considerable time; you are encouraged to work closely with the AC to obtain approval before Committee activity is anticipated.

#### Timeline recommendations

- 1) Meet with your thesis Advisor at least once a month while working on your thesis.
- 2) Work with your thesis Committee to finalize your thesis topic. You must submit for approval the composition of your Committee in the Student Information System (SIS) ([www.student.msu.edu](http://www.student.msu.edu)).
- 3) By the end of your second semester meet with your thesis Committee, and discuss the scope of your work before Committee members sign the "Approval of Thesis Proposal topic" on the MS Progress Form.
- 4) Continue to meet with your thesis Committee to discuss your progress.

## 8. Thesis Requirements (Plan A only)

### A. Master's Thesis Content/Format

The purpose of the Master's thesis is to give you the opportunity to use modern biostatistical methods to effectively analyze complex medical and public health data and effectively communicate the findings with research scientists in interdisciplinary collaborations. It will use probabilistic and statistical reasoning and theory to address standard or non-standard problems arising in medicine and public health research.

We have identified the following components for a typical Master's thesis:

- (1) Description of the design of a research study in medicine and public health, including the research question(s), population selection, sample size justification and hypotheses to be tested.
- (2) Statistical analysis plan for the proposed hypotheses.
- (3) Analysis and interpretation of the quantitative results, including graphical and tabular displays, descriptive statistics, and statistical inferences.

*Examples of prior theses are available in the Academic Coordinator's office and online at the MSU Library.*

### B. Human Subjects Protection for Master's Thesis

See <https://hrpp.msu.edu/help/graduate-student.html> (graduate student research at MSU).

If you are undertaking human subjects research, you must complete MSU's online IRB training (<https://hrpp.msu.edu/training/index.html>). When applicable, your thesis proposal should be submitted for approval to the MSU Human Research Protection Program or the corresponding animal safety committee, when the research requires use of data from or contact with human participants or animal subjects. In some instances, if you are working on data from an ongoing research project with Institutional Review Board (IRB) approval, you will need to apply to the IRB. A copy of your IRB approval letter is required by the Graduate School at the time of final submission of your thesis.

### C. MS Thesis Defense

1. You must be enrolled for at least one credit at the time of your defense.
2. Committee members must sign and date the "Approval to Defend" section of the MS Progress Form.
3. Per MSU policy, all thesis defenses are open to the public. All department faculty and students are invited and encouraged to attend.
4. At least two weeks prior to your defense: in consultation with your adviser, you shall appoint a department faculty member who is not on your committee to serve as an External Examiner (**EE**) at your defense. At least one week prior to defense, send EE an electronic copy of your thesis. The role of the EE is to ensure a fair process by observing and contributing to the defense. The EE will have no vote.
5. Your thesis defense is scheduled to last approximately two hours, progressing through the following stages:
  - a. Committee Chair introduces all Committee members (including EE);
  - b. Student oral presentation (30 - 60 minutes);
  - c. Question/answer session open to the public;
  - d. Question/answer session with student and Committee members only;

- e. After your temporary dismissal from the room, Committee has private deliberation and subsequent vote on your defense;
- f. You reunite with Committee, and are informed of the Committee's decision;
- g. Committee Chair leads a discussion regarding revisions (if any), and expected timelines for receiving revisions and final sign-off of the thesis.

#### **D. Thesis Evaluation and Final Acceptance**

One of the following outcomes is assigned by the Thesis Committee after the defense:

- a. Acceptable as is.
- b. Acceptable with minor revisions.
- c. Acceptable with major revisions.
- d. Unacceptable

You will be informed about the procedure for evaluating and accepting the revisions. For example, your Committee may turn the evaluation task over to the thesis Committee Chair or may delegate the authority to another committee member or members. Following the thesis defense, all Committee members must sign and date the "Thesis Sign off" section of the MS Progress Form (<https://epibio.msu.edu/students/>); submit this form to the Academic Coordinator. Revisions will be specified on the form. Your thesis Committee Chair must sign the form indicating approval of all revisions. Only then will you be eligible for graduation. You do not need to be enrolled when completing revisions or applying for graduation. If the final defense is not successful, you have one more opportunity to make corrections and to defend successfully.

#### **9. Masters Student Timeline (for students following Plan A or B)**

Before first semester:

- a. Meet with your Advisor to discuss your coursework plan and research interests.
- b. Initiate course equivalency/credit transfer approval process.

Within first two semesters:

- c. Meet with your Advisor to define the scope of your thesis or Capstone, and identify a Committee. Meet with your Committee to provide brief overview of thesis or Capstone.

Third semester onwards:

- d. Complete MS proposal approval section on the MS Progress Form and provide to the Academic Coordinator.
- e. Meet with your thesis Advisor and Committee as needed to complete the thesis or Capstone and to report on coursework progress.

Preparing for thesis or Capstone defense and defense (open to public, described above):

- f. The full Committee needs to agree your thesis or Capstone project is defensible (recommended 6-8 weeks before defense date).
- g. You must be enrolled for at least one credit at the time of your defense.
- h. The final draft of your thesis or Capstone project **MUST** be submitted to each Committee member at least 2 weeks before your defense date (preferably 4 weeks). Your Advisor and/or Committee members may require more time to review your thesis.
- i. Notify the Academic Coordinator at least 2 weeks before your thesis or Capstone defense to allow time to schedule and publicize your defense.
- j. Thesis or Capstone sign-off: Present the MS Progress Form to your Committee at your defense in-person, or electronically after the defense; submit to Academic Coordinator.

After thesis or Capstone defense:

- k. Complete any specified revisions as soon as possible. You will not receive your Masters degree until revisions are completed, your Thesis or Capstone Committee Chair has signed-off, and your thesis has been submitted to the Graduate School.
- l. Submit **electronic** thesis and any required IRB approval letter to the Graduate School.
- m. Submit one **print** copy of your thesis or Capstone to the Academic Coordinator.
- n. All requirements of your Masters Program must be completed within 6 years.

### III. DOCTOR OF PHILOSOPHY IN EPIDEMIOLOGY — DEGREE REQUIREMENTS

#### 1. Course Requirements

In addition to the required MS coursework, the PhD student must complete at least 51 credit hours distributed between core required coursework, elective coursework, or faculty-guided learning experiences (e.g., independent study), and dissertation research.

##### Required: Epidemiology Core Courses (6 credits)

EPI 805 Readings in the Historical Roots of Epidemiological Thought	3
EPI 910 Themes in Contemporary Epidemiology	3

##### Required if no prior Epi 828 (or equivalent e.g. KIN 895) and/or RCR (total 1 credit)

EPI 828 Seminar in Responsible Conduct of Research PLUS	1
ALL Graduate School sessions in Responsible Conduct of Research series - non-credit	0

##### Required: Biostatistics Core Courses (choose two courses, 6 credits)

EPI 855 Biostatistical Modeling in Genomic Data Analysis	3
EPI 920 Advanced Methods in Epidemiology & Applied Statistics	3
EPI 950 Advanced Biostatistical Methods in Epidemiology	3
EPI 952 Duration and Severity Analysis	3
EPI 953 Analytic Strategies for Observational Studies	3

##### Electives: (choose 5 courses or 15 credits from courses below)

EPI 815 Epidemiology of Cardiovascular Disease  
EPI 816 Perinatal Epidemiology  
EPI 819 Spatial Epidemiology and Medical Geography  
EPI 823 Cancer Epidemiology  
EPI 835 Neuroepidemiology  
STT 847 Analysis of Survival Data  
EPI 910 Themes in Contemporary Epidemiology  
EPI 920 Advanced Methods in Epidemiology and Applied Statistics  
EPI 950 Advanced Biostatistical Methods in Epidemiology  
EPI 951 Latent Variable Modeling  
EPI 952 Duration and Severity Analysis  
EPI 953 Analytic Strategies for Observational Studies  
EPI 990 Independent Study\*  
EPI 977 Social Epidemiology  
EPI 979 Advanced Topics in Infectious Disease Epidemiology

Courses from outside the department (MSU or elsewhere) may also be used after approval by your Advisor and the Graduate Program Director.

##### EPI 999 Dissertation Research (24 credits)

A minimum of 24 dissertation research credits is required for graduation, and a maximum of 36 credits is allowed.

##### *\*Independent Study Credits:*

A maximum of **nine (9) credits** can be earned through Independent Study and credited as electives in the PhD program. You may take Independent Study credits by making appropriate arrangements with a faculty member, completing the Application for Independent Study Form at <https://epibio.msu.edu/students/>, and registering for EPI 990.

**Scientific Integrity:** All Epidemiology PhD students must complete the entire set of MSU Graduate School workshops on Responsible Conduct of Research (RCR) and earn the Certificate of Completion (<https://grad.msu.edu/rcr/>). You must also enroll in EPI 828 (1 credit), and complete the necessary online MSU Institutional Review Board (IRB) training if the thesis work requires MSU IRB approval (<https://www.humanresearch.msu.edu>).

## 2. Other Requirements and Opportunities for Professional Development

The PhD program requires you to be resident as a full-time student for 2 consecutive semesters involving the completion of at least six credits of graduate work each semester. During this time, you are expected to be a full-time participant in the academic life of the department, the college, and the university, with attendance and engagement in research work, meetings, the department's seminars, grand rounds, and other appropriate learning experiences pertinent to the content of your future research career.

*When in residence (i.e., full-time status—minimum of six credits-- for two consecutive semesters) all PhD students are required to participate in journal club and seminars:*

- 1) PhD Journal Club. You must attend a minimum of 6 meetings during 2 consecutive semesters in residence, including one in which you are responsible for selecting readings in consultation with a faculty facilitator (approx. 7 journal club meetings are scheduled each academic year),
- 2) Departmental Seminar Series (Thursday afternoons): attend at least 80% of all presentations.

There is a sign-in sheet at each PhD Journal Club and Departmental Seminar. Your attendance will be noted on the Course of Study Worksheet that is to be reviewed with your Advisor in preparation for the year-end annual graduate student review.

## 3. Academic Standards

- a. The minimum cumulative grade-point average (GPA) required for graduation is 3.0. This is an MSU and departmental rule. [MSU RO: Academics](#) (see "Academic Standards")

In any given semester, a minimum 3.0 GPA is required.

In any given semester, a minimum grade of 2.5 in a **core** or **elective** course must be achieved.

- If your grade in a **core** course is below 2.5, you must retake the core course at the next available time offered and receive a grade of 3.0 or better.
  - If your grade in an **elective** course is below 2.5, you can either replace the elective course, or retake the course, at the next available time and must receive a grade of 3.0 or better.
  - No more than one retake is allowed per **core** or **elective** course.
  - No more than two **core** and two **elective** courses may be retaken/replaced during the degree program.
  - If you receive two (2) course grades (**core** or **elective**) of 2.0 or below your record will be reviewed by the Graduate Program Committee (GPC).
- b. If you fail to meet minimum standards your record will be reviewed by the Department's GPC and may result in your removal from the program.

## 4. Course Equivalency/transfer credit approval process

**IF** you completed graduate-level courses prior to entering MSU's MS Epidemiology program, **AND** those courses match existing courses in our MS curriculum, you may request:



a) a transfer of credits and b) exemption from a course requirement.

Both of these requests require the Course Equivalency Form approval process (<https://epibio.msu.edu/students/>). You should make these requests early in your MS program.

- a. Transfer Credits: You may transfer a **maximum of nine (9)** credits from prior graduate-level, matching courses toward your credit requirement for the PhD (Example: 51 - 9 = **42 credits**).
- b. Course Equivalency: You must obtain course equivalency approvals for all previous graduate level Epidemiology/Biostatistics coursework (**except MSU Epidemiology/Biostatistics courses**). This ensures that courses taken as part of your previous degree are equivalent to the required courses in the MSU MS in Epidemiology or Biostatistics curriculum. If the courses are not deemed equivalent, you must complete MSU's required MS courses in Epidemiology or Biostatistics; these credits are in addition to required PhD credits.

For both transfer of credits and course equivalency approvals, your prior courses must be approved as equivalent to MSU courses by your: 1) Advisor, 2) Instructor of the potential equivalent departmental course(s), and 3) Graduate Program Director (GPD).

## 5. Credits and other requirements for Sequential vs PhD-only degree programs

- Option 1: Sequential MS and PhD degrees: Admission to the MS program, followed by later admission to the PhD after a separate application.
- Option 2: PhD-only: Direct admission to the PhD program.

Option 1 (Sequential): After completing the required 40 credits of the MS program (see requirements for MS in Epidemiology, page 1), you can transfer 9 of these MS credits towards the PhD program, thereby reducing your required PhD credits from 51 to 42. Total credits required for sequential MS (40) and PhD (42) degrees = **82 credits**.

If you completed graduate courses prior to entering the MSU PhD Epidemiology program, you can transfer a maximum of 9 credits from these courses towards the MS program, thereby reducing your required MS credits from 40 to a minimum of 31. These courses must match existing course options in the MSU program and be approved by your 1) Advisor, 2) Instructor of the equivalent MSU Epidemiology course(s), and 3) Department Graduate Program Director. If 9 credits are successfully transferred, the total required credits for the sequential MS (31) and PhD (42) degrees = **73 credits**.

Option 2 (PhD-only): If you are admitted directly to the MSU PhD program in Epidemiology, you must complete the 36 required course credits of the MS program, but not the 4 thesis credits (because you will not receive the MS degree). These 36 MS credits will be added to the 51 required PhD credits, for a total requirement of **87 credits**.

***PhD-only students (i.e., no previous MS degree in Epidemiology) are required to submit, in lieu of the MS thesis, one of the following first-authored works: 1) a previous peer-reviewed publication; 2) a manuscript of publishable quality; 3) a grant application judged likely to be funded. This work will be submitted to your Advisor and Department Graduate Program Committee prior to taking the Comprehensive Examination.***

If you completed graduate courses prior to entering the MSU PhD Epidemiology program, a maximum of 9 credits from these courses can be counted toward the PhD. These courses must match existing course options in the MSU Epidemiology program and be approved by your 1) Advisor, 2) Instructor of the equivalent MSU epidemiology course(s), and 3)

Department Graduate Program Director. Example: if nine credits are successfully transferred, the total required credits (87) for the PhD-only degree will be reduced to **78 credits**.

## 6. Time Limits

From initial enrollment, you have eight (8) years to complete all requirements for the PhD degree. It is your responsibility as the student to monitor your progress in this timeframe.

## 7. PhD Qualifying Examination

You will be responsible for taking a Qualifying Examination (QE) at the end of your first year of study. The purpose of the QE is to determine if you should be encouraged to proceed to year two in the doctoral program and to identify weaknesses (if any) in your background knowledge which may be strengthened by including specific courses in your doctoral program.

Details pertaining to the QE are as follows:

1. To sit for the QE, you must be in good academic standing based on Graduate School and departmental standards;
2. The QE is normally scheduled the week after spring semester final examinations. Please do not make travel plans at or around that time until the specific exam dates have been confirmed;
3. The examination is given as two (2) components on separate days (the Epi component on one day and the biostatistics component on a separate day), but the components are graded as a single exam.
4. The QE will consist of two questions from three core epidemiology courses (810, 817, 990/829) and from two core biostatistics courses (808, 809). Overall, you must pass 8 out of these 10 questions, with a passing grade of 70% (7/10) on each question.
5. If you do not pass the QE, a Remediation Examination (RE) will need to be taken and will involve retaking both components (epi and biostats). This exam will be scheduled in mid-August and graded before the fall semester begins. You cannot register for fall semester courses until you pass the RE.
6. If you do not pass the RE, you will not be able to continue in the PhD program. In this case, you will be given the opportunity to complete an MS degree.

## 8. Student progress

- a) Find student forms at <https://epibio.msu.edu/students/>
- b) Update your Course of Study Worksheet at the end of each semester
- c) Update your MS Progress Form as you progress on dissertation activities
- d) Obtain signature approvals on these forms from your Advisor and dissertation Committee, and file these forms with the Academic Coordinator.

**Annual Review:** Timely completion of these progress forms helps your Advisor prepare for your annual review at the end of spring semester each year.

## 9. Advisor, Dissertation Advisor, Dissertation Committee

### A. Advisors

It is your responsibility to schedule regular meetings with your Advisor to review your progress. Ordinarily, your Advisor becomes your dissertation Advisor and your dissertation Committee Chair. Under certain conditions it may be appropriate to arrange for a different dissertation Advisor, with approval of both your original and potential new advisor and the GPD.

### B. Dissertation Committee (Guidance Committee)

Your dissertation Advisor (dissertation Committee Chair) is a tenure-track faculty member in the Department of Epidemiology and Biostatistics. Any other MSU faculty member who was previously approved as a committee member by the Graduate School can serve as Committee Chair, with the approval of the Department Chair. \* Your advisor will work with you to select a dissertation Committee that will consist of your dissertation Advisor plus at least three additional tenure-stream faculty members (or any other MSU faculty members subject to The Graduate School approval). One of the three additional faculty members must also be from the Department of Epidemiology and Biostatistics, and one may be selected from another department within or outside MSU. It is required that at least one of your committee members has expertise in epidemiology and one has expertise in biostatistics.

This dissertation Committee should be selected as soon as possible after your dissertation Advisor has been designated and your dissertation topic has been chosen. Optimally, your dissertation Committee will be formed as soon as possible after successful completion of the Comprehensive Examination. You must submit for approval the composition of your Committee in the Student Information System (SIS).

\*The Graduate School must approve all committee members (MSU tenure-track and tenured faculty are automatically approved as committee members). All others from inside or outside MSU can only be approved after the department Academic Coordinator obtains and submits a 'package of documents' to The Graduate School. As this process can take considerable time, you are strongly encouraged to initiate the approval process well in advance of the anticipated committee activity.

## 10. Comprehensive Examination

### Overview and Timeline

The Epidemiology PhD Comprehensive Examination (**Comps**) is a two-step process beginning with a written part followed by an oral examination. Comps is designed to evaluate your readiness to begin your PhD dissertation research project and advance to "candidacy."

A PhD candidate has successfully passed these two milestones: 1) the Qualifying Exam and 2) the Comprehensive Examination (both written and oral parts).

You may take up to 6 dissertation credits (Epi 999) prior to completing Comps. You must pass Comps (both written and oral parts) before starting your dissertation research.

The Department will appoint an External Examiner (**EE**) from the Epi/Biostats faculty to serve as key facilitator of the Comps exam process, and an independent arbiter in evaluating your Comps.

Written Comps can be submitted to your dissertation Committee no earlier than Fall semester of your 2<sup>nd</sup> year, and no later than Fall semester of your 3<sup>rd</sup> year, in the PhD program. Oral Comps usually follows within a month.

### **Written Comps**

#### **1. What you will prepare:**

- Write a **pre-doctoral grant proposal** (similar to F31) on the subject of your dissertation research, ready for review by a granting agency. The grant proposal must include:
  - Specific Aims: one (1) page or less
  - Research Strategy: six (6) page maximum on “Significance, Innovation, Approach”, using typical NIH formatting requirements.
  - References: correctly formatted
  - Supplemental materials: ten (10) pages maximum
- Work on the grant can begin at any time. Work closely with your Committee to identify a research topic and granting agency format. After incorporating Committee feedback in your drafts, you are responsible for submitting the grant to your Committee.

#### **2. Your EE/Committee will reply within two (2) weeks of grant proposal submission:**

- Each of your Committee members will provide **comments and a provisional grade** on the grant proposal (5 point scale: excellent, good, average, below average, unacceptable). If any grade is unacceptable, you may revise and resubmit the grant proposal.
- EE will send you **a set of written Comp Questions** (one from each Committee member)
  - Questions will relate to your grant (F31) proposal, such as biological plausibility, epidemiological principles, statistical methods, or subject matter. Their purpose is to prompt independent and critical thinking and problem-solving. Therefore, answers must be your own work and you may not receive help from your Committee.
  - EE will check Comp questions for fairness, clarity, etc before sending to you.

#### **3. Next steps and forms for Oral Comps**

- Send the EE your **written responses to Comp Questions within one week**. To ensure these responses reflect your independent work, you may ask the EE - but not your Committee members or Advisor - if you need clarification of any Comp Questions.
- Oral Comps is scheduled approximately 2 weeks after you receive the Comp Questions.
- Upon approving a date for Oral Comps, ask your Committee members to complete the “Epi Comps Approval” section of the PhD Dissertation form.
- Your Advisor is responsible for organizing and overseeing your Oral Comps and will electronically submit the completed “Epi Comps Approval” section of the PhD Progress Form to the Academic Coordinator.
- Committee brings comments and grades on Comp Questions (5-point scale) to Oral Comps.

### **Oral Comps (approximately 2 hours)**

- Deliver an oral presentation of your dissertation research plan; this is a closed session with only your Committee and EE.
- This is an opportunity to demonstrate your competency in core epidemiologic and biostatistics concepts, particularly as they apply to your proposed research.
- “Question and Answer”: Questions can cover any topic relevant to your oral presentation, grant proposal, and Written Comp Questions.
- When the EE and Committee determine that the Oral Exam is done, you will be asked to leave the room (physical or electronic) and the Committee will vote on an outcome.

## Evaluation

- The Committee will discuss and evaluate your performance, and a simple majority vote decides one of three possible outcomes:
  - a. Pass the entire Comps Exam.
  - b. Pass a portion of the Comps Exam, necessitating partial remediation.
  - c. Failure. At least two (2) members of the Committee must agree that the Comps Exam was not passed to justify a failed examination. A tie vote will be regarded as a fail.
- Once your Committee decides on an outcome, you will be summoned back into the “room,” and your Advisor will inform you of the outcome.

### Passing Outcome

- Your Advisor will complete the “Epi Comps Evaluation” section of the PhD Progress Form, to be signed and dated by all Committee members.
- You now become a PhD candidate.

### Partial Remediation Outcome

- Discuss this outcome with your Advisor, who will provide you a remediation plan (in writing).
- Within one (1) week, your Committee must report (in writing) where your performance was deemed non-satisfactory.
- Remediation may include additional coursework, a repeat of the Oral Exam (preferably within three months after the first attempt), and/or other measures.
- The plan is shared with you, the Grad Program Director, and Academic Coordinator.
- Your Advisor and committee members will determine if your remediation was successful.
- If successful, your Advisor will complete the “Epi Comps Evaluation” section of the PhD Progress Form, to be signed and dated by all committee members.
- You now become a PhD candidate.

### Failure Outcome

- Discuss this outcome with your Advisor.
- Within one (1) week, your Committee must report to you (in writing) where your performance was deemed non-satisfactory.
- The report is also shared with the Grad Program Director and Academic Coordinator.
- You will not move to candidacy or be able to make further progress toward the PhD.
- If you believe that this outcome is unfair, you may prepare a petition to submit to the Department Chair. Under these circumstances, the Graduate Program Director will act impartially, limiting assistance to helping you prepare your petition to present to the Chair.
- If it is determined that you cannot continue in the PhD program, all reasonable efforts will be made to assist you in completing the MS degree, if desired.

## **11. PhD Dissertation Requirements**

### **A. PhD Dissertation Content/Format**

The purpose of the PhD dissertation is to apply Epidemiology training to a health issue and make a substantive contribution to the field. Two formats are acceptable for a PhD Epidemiology dissertation project. The PhD dissertation project should be substantial enough after suitable peer review to 1) yield three publishable scientific articles, or (2) be



publishable as a full-length monograph by a university publishing house or other approved publishers. You are encouraged to elect the first option to expedite publication in peer-reviewed journals.

The dissertation itself will follow standards of the field, according to the specifications of the dissertation Committee. One standard model\* includes these chapters:

- 1) Description of potential scientific/public health significance of research topic, as well as hypotheses, research questions, or specific aims of project
- 2) Careful, thoroughly scholarly review of theory and literature underlying project
- 3) Methodology detailing research approach and statistical methods
- 4) Study results: 3 chapters, one for each of 3 publishable scientific articles
- 5) Discussion/conclusion: Summarizes main points on new evidence and limitations; reviews results in context of past theory and evidence; outlines directions for future research; provides summary including implications with respect to theory, new research and when pertinent, public health practice.

*\*Examples of prior dissertations are available in the Academic Coordinator's office and online at the MSU Library.*

## **B. Human Subjects Protection for PhD Dissertation**

See <https://hrpp.msu.edu/help/graduate-student.html> (graduate student research at MSU).

If you are undertaking human subjects research, you must complete MSU's online IRB training (<https://hrpp.msu.edu/training/index.html>). When applicable, the dissertation proposal should be submitted for approval to the MSU Human Research Protection Program or the corresponding animal safety committee, when the research requires use of data from or contact with human participants or animal subjects. In some instances, students working on data from an ongoing research project with Institutional Review Board (IRB) approval will be asked to apply to the IRB. Your IRB approval letter is required by the Graduate school at the time of final submission of your dissertation.

## **C. Dissertation Defense**

1. You must be enrolled for at least one credit at the time of your defense.
2. Committee members must sign the "Approval to Defend" section of the PhD Progress Form.
3. Dissertation Sign-off: Present the PhD Progress Form to your Committee at your defense in-person, or electronically after the defense, and submit to the Academic Coordinator.
4. It is an MSU policy that all dissertation defenses are open to the public and all Epidemiology and Biostatistics faculty and students are encouraged to attend.
5. You and your Dissertation Advisor shall select one faculty member from the Department of Epidemiology and Biostatistics, who is not a dissertation committee member, to serve as an External Examiner (**EE**) at the defense. The EE shall be identified before the defense is scheduled. The EE is invited to read the dissertation prior to the defense. The role of the EE is to observe the presentation, advocate on behalf of the student as necessary, and be present during closed door deliberations. The EE will have no vote.
6. Your dissertation defense is scheduled to last approximately two hours, progressing through the following stages:

- a. Committee Chair introduces all Committee members (including EE);
- b. Student oral presentation (30 - 45 minutes);
- c. Question/answer session open to the public;
- d. Question/answer session with student and Committee members only;
- e. After your temporary dismissal from the room, Committee has private deliberation and subsequent vote on your defense;
- f. You reunite with Committee, and are informed of the Committee's decision;
- g. Committee Chair leads a discussion regarding revisions (if any), and expected timelines for receiving revisions and final sign-off of the thesis.

#### **D. Dissertation Evaluation and Final Acceptance**

One of the following outcomes is assigned by the Committee after the defense:

- Acceptable as is;
- Acceptable with minor revisions;
- Acceptable with major revisions;
- Unacceptable

The first three outcomes constitute a passing defense.

Once your dissertation Advisor has accepted all agreed upon edits, the Advisor will approve the dissertation and you will submit it to the Graduate School.

### **12. PhD Student Timeline**

Before first semester:

- a. Meet with your Advisor to discuss your coursework plan and research interests.
- b. Initiate course equivalency/credit transfer approval process.

Within first two semesters:

- c. Sit for Qualifying exam at end of first spring semester.

After passing Qualifying exam:

- d. Form the dissertation Committee.
- e. Complete PhD proposal approval section on the PhD Progress Form and provide to the Academic Coordinator.
- f. Complete the Comprehensive Exam (written and oral) and submit required forms.
- g. Enter all information in SIS (Student Information System).
- h. Obtain IRB approval.
- i. Complete the research described in the dissertation proposal and complete any additional coursework as needed.
- j. Preparing for dissertation defense and defense (open to public, described above):
- k. The full Committee needs to agree your dissertation is defensible (recommended 6-8 weeks before defense date).
- l. You must be enrolled for at least one credit at the time of your defense.
- m. The final draft of your dissertation MUST be submitted to each Committee member at least 2 weeks before your defense date (preferably 4 weeks). Your Advisor and/or Committee members may require more time to review your dissertation.
- n. Notify the Academic Coordinator at least 2 weeks before your dissertation defense to allow time to schedule and publicize your defense.
- o. Dissertation sign-off: Present the PhD Progress Form to your Committee at your defense in-person, or electronically after the defense, and submit to the Academic Coordinator.

After dissertation defense:

- p. Complete any specified revisions as soon as possible (preferably within the semester). You will not receive your PhD degree until revisions are completed, your dissertation Committee Chair has signed-off, and your dissertation has been submitted to the

Graduate School. You do not need to be enrolled when completing revisions or applying for graduation.

- q. Submit **electronic** dissertation and any required IRB approval letter to the Graduate School.
- r. Submit one **print** copy of your dissertation to the Academic Coordinator.
- s. All requirements of your PhD Program must be completed within 8 years.

#### IV. DOCTOR OF PHILOSOPHY IN BIOSTATISTICS — DEGREE REQUIREMENTS

The PhD in Biostatistics program offers three concentrations (emphases):

- 1. Design and Analysis of Medical Studies/Clinical trials
- 2. Big Data & Statistical Genetics
- 3. Biometry/ Flexible emphasis

##### 1. Course Requirements

The course requirements for the three concentrations differ. All PhD students must complete at least 51 credit hours distributed among core courses, electives/faculty-guided learning experiences (e.g. independent study) and dissertation research.

##### **ALL concentrations require these four core courses (12 Credits)**

Epi 810 Introductory Epidemiology	3
EPI 860 Advanced Inference for Biostatistics	3
STT 867 Linear Model Methodology	3
STT 868 Mixed models: Theory, Methods and Applications	3

##### **Required if no prior Epi 828 (or equivalent e.g. KIN 895) and/or RCR (total 1 credit)**

EPI 828 Seminar in Responsible Conduct of Research PLUS	1
ALL Graduate School sessions in Responsible Conduct of Research series - non-credit	0

##### **Concentration – Design and Analysis of Medical Studies/Clinical trials**

##### **Choose one of these courses (3 credits):**

EPI 858 Clinical Trial I	3
EPI 952 Duration and Severity Analysis	3
STT 847 Analysis of Survival Data	3

##### **Complete 11 credits of elective course work:**

ANS 814 Advanced Statistics for Biologists	4
CSE 331 Algorithms and Data Structures	3
CSE 480 Database Systems	3
CSE 482 Big Data Analysis	3
CSE 847 Machine Learning	3
CSE 881 Data Mining	3
EC 821A Cross Section and Panel Data Econometrics I	3

EC 821 Cross Section and Panel Data Econometrics II	3
Epi 855 Biostatistical Modeling in Genomic Data Analysis	3
Epi 880 Selected Topics in Biostatistics	3
Epi 920 Advanced Methods in Epidemiology and Applied Statistics	3
Epi 950 Advanced Biostatistical Methods in Epidemiology	3
Epi 952 Duration and Severity Analysis	3
Epi 953 Analytical Strategies for Observational Studies	3
Epi 990 Independent Study	3
STT 801 Design of Experiments	3
STT 825 Sample Surveys	3
STT 855 Statistical Genetics	3
STT 861 Theory of Probability and Statistics I	3
STT 862 Theory of Probability and Statistics II	3
STT 873 Statistical Learning and Data Mining	3
STT 874 Introduction to Bayesian Analysis	3

*Additional courses may be chosen with Advisor approval*

### **Concentration 2 – Big Data and Statistical Genetics**

#### **Complete one of the following courses (3 credits)**

EPI 855 Biostatistical Modeling in Genomic Data Analysis	3
OR	
STT 855 Statistical Genetics	3
CSE 231 Introduction to Programming 1	3
OR	
CSE 232 Introduction to Programming 2	3
STT 456 Actuarial Models	3

#### **Complete 11 credits of elective course work**

ANS 814 Advanced Statistics for Biologists	4
CSE 331 Algorithms and Data Structures	3
CSE 480 Database Systems	3
CSE 482 Big Data Analysis	3
CSE 847 Machine Learning	3
CSE 881 Data Mining	3
EC 821A Cross Section and Panel Data Econometrics I	3
EC 821 Cross Section and Panel Data Econometrics II	3
Epi 858 Clinical Trials	3
Epi 880 Selected Topics in Biostatistics	3
Epi 920 Advanced Methods in Epidemiology and Applied Statistics	3
Epi 950 Advanced Biostatistical Methods in Epidemiology	3
Epi 952 Duration and Severity Analysis	3
Epi 953 Analytical Strategies for Observational Studies	3
Epi 990 Independent Study*	3
STT 801 Design of Experiments	3
STT 825 Sample Surveys	3
STT 861 Theory of Probability and Statistics I	3
STT 862 Theory of Probability and Statistics II	3
STT 873 Statistical Learning and Data Mining	3
STT 874 Introduction to Bayesian Analysis	3

*Additional courses may be chosen with Advisor approval*

## Concentration 3 – Biometry/Flexible Emphasis

### Complete 14 credits of elective courses:

ANS 814 Advanced Statistics for Biologists	4
CSE 331 Algorithms and Data Structures	3
CSE 480 Database Systems	3
CSE 482 Big Data Analysis	3
CSE 847 Machine Learning	3
CSE 881 Data Mining	3
EC 821A Cross Section and Panel Data Econometrics I	3
EC 821 Cross Section and Panel Data Econometrics II	3
Epi 855 Biostatistical Modeling in Genomic Data Analysis	3
Epi 858 Clinical Trials	3
Epi 880 Selected Topics in Biostatistics	3
Epi 920 Advanced Methods in Epidemiology and Applied Statistics	3
Epi 950 Advanced Biostatistical Methods in Epidemiology	3
Epi 952 Duration and Severity Analysis	3
Epi 953 Analytical Strategies for Observational Studies	3
Epi 990 Independent Study*	3
STT 801 Design of Experiments	3
STT 825 Sample Surveys	3
STT 847 Survival Analysis	3
STT 855 Statistical Genetics	3
STT 861 Theory of Probability and Statistics I	3
STT 862 Theory of Probability and Statistics II	3
STT 873 Statistical Learning and Data Mining	3
STT 874 Introduction to Bayesian Analysis	3

Courses from outside the department (MSU or elsewhere) may also be used after approval by your Advisor and the Graduate Program Director. *Any course in Epidemiology can be used as an elective.*

### EPI 999 Dissertation Research (24 credits)

A minimum of 24 dissertation research credits is required for graduation, and a maximum of 36 credits is allowed.

**Scientific Integrity:** All Biostatistics PhD students must complete the entire set of MSU Graduate School workshops on Responsible Conduct of Research (RCR) and earn the Certificate of Completion (<https://grad.msu.edu/rcr/>). All students must also enroll in EPI 828 (1 credit), and complete the necessary online MSU Institutional Review Board (IRB) training, if the thesis work requires MSU IRB approval (<https://www.humanresearch.msu.edu>).

### *\*Independent Study Credits:*

A maximum of **nine (9) credits** can be earned through Independent Study and credited as electives in the PhD program. You may take Independent Study credits by making appropriate arrangements with a faculty member, completing the Application for Independent Study Form at <https://epibio.msu.edu/students/>, and registering for EPI 890.

## 2. Other Requirements and Opportunities for Profession Development

The Biostatistics PhD program requires you to be resident as a full-time student for 2 consecutive semesters involving the completion of at least six credits of graduate work each semester. During this time you are expected to be a full-time participant in the academic life of the department, the



college, and the university, with attendance and engagement in research work, meetings, the department's seminars, grand rounds, and other appropriate learning experiences pertinent to the content of your future research career.

*When in residence (i.e., full-time status—minimum of six credits-- for two consecutive semesters) all PhD students are required to participate in journal club and seminars:*

- 1) PhD Journal Club. You must attend a minimum of 6 meetings during 2 consecutive semesters in residence, including one in which you are responsible for selecting readings in consultation with a faculty facilitator (approx. 7 journal club meetings are scheduled each academic year).
- 2) Departmental Seminar Series (Thursday afternoons): attend at least 80% of all presentations.

There is a sign-in sheet at each PhD Journal Club and Departmental Seminar. Your attendance will be noted on the Course of Study Worksheet that is to be reviewed with your Advisor in preparation for the year-end annual graduate student review.

Biostatistics PhD students are encouraged to seek out research collaborations and initiate research activities early in their graduate program.

### 3. Academic Standards

- a. The minimum cumulative grade-point average (GPA) required for graduation is 3.0. This is an MSU and departmental rule. [MSU RO: Academics](#) (see "Academic Standards".)

In any given semester, a minimum 3.0 GPA is required.

In any given semester, a minimum grade of 2.5 in a **core** or **elective** course must be achieved.

- If your grade in a **core** course is below 2.5, you must retake the core course at the next available time offered and receive a grade of 3.0 or better.
  - If your grade in an **elective** course is below 2.5, you can either replace the elective course, or retake the course, at the next available time and must receive a grade of 3.0 or better.
  - No more than one retake is allowed per **core** or **elective** course.
  - No more than two **core** and two **elective** courses may be retaken/replaced during the degree program.
  - If you receive two (2) course grades (**core** or **elective**) of 2.0 or below your record will be reviewed by the Graduate Program Committee (GPC).
- b. If you fail to meet minimum standards your record will be reviewed by the Department's GPC and may result in your removal from the program.

### 4. Course Equivalency/transfer credit approval process

**IF** you completed graduate-level courses prior to entering MSU's PhD Biostatistics program, **AND** those courses match existing courses in our MS curriculum, you may request:

- a) a transfer of credits and b) exemption from a course requirement.

Both of these requests require the Course Equivalency Form approval process (<https://epibio.msu.edu/students/>). You should make these requests early in your PhD program.

- c. Transfer Credits: You may transfer a **maximum of nine (9)** credits from prior graduate-level, matching courses toward your credit requirement for the PhD (Example: 51 - 9 = **42 credits**).

- d. **Course Equivalency:** You must obtain course equivalency approvals for all previous graduate level Epidemiology/Biostatistics coursework (**except MSU Epidemiology/Biostatistics courses**). This ensures that courses taken as part of your previous degree are equivalent to the required courses in the MSU MS in Epidemiology or Biostatistics curriculum. If the courses are not deemed equivalent, you must complete MSU's required MS courses in Epidemiology or Biostatistics; these credits are in addition to required PhD credits.

For both transfer of credits and course equivalency approvals, your prior courses must be approved as equivalent to MSU courses by your: 1) Advisor, 2) Instructor of the potential equivalent departmental course(s), and 3) Graduate Program Director (GPD).

## **5. Time Limits**

From initial enrollment, you have eight (8) years to complete all requirements for the PhD degree. It is your responsibility as the student to monitor your progress in this timeframe.

## **6. Student Progress**

- a) Find student forms at <https://epibio.msu.edu/students/>
- b) Update your Course of Study Worksheet at the end of each semester
- c) Update your MS Progress Form as you progress on dissertation activities
- d) Obtain signature approvals on these forms from your Advisor and dissertation Committee, and file these forms with the Academic Coordinator.

**Annual Review:** Timely completion of these progress forms helps your Advisor prepare for your annual review at the end of spring semester each year.

## **7. Advisor, Dissertation Advisor, Dissertation Committee**

### **A. Advisors**

It is your responsibility to schedule regular meetings with your Advisor. Ordinarily, your Advisor becomes your dissertation Committee Chair. Under some conditions it may be appropriate to arrange for a different dissertation Advisor, with approval of both your original and potential new advisor and the GPD.

### **B. Dissertation Committee (Guidance Committee)**

Your dissertation Committee Chair is a tenure-track biostatistics faculty member in the Department of Epidemiology and Biostatistics. Any other MSU faculty member can serve as Committee Chair with the approval of the Department Chair, provided that she/he has been previously approved as a Committee member by The Graduate School. Co-chairing is possible provided that one of the chairpersons is tenure-track. The advisor will work with you to select a dissertation Committee that will consist of the dissertation Advisor plus at least three additional tenure-track faculty members, or any other MSU faculty members or outside members subject to The Graduate School approval. It is required that at least two of the Committee members have expertise in biostatistics/statistics. \* The number of non-regular faculty may not exceed the number of regular MSU faculty on the Committee.

Your dissertation Committee should be formed as soon as possible after your dissertation Advisor has been designated and your dissertation topic has been chosen. You must submit for approval the composition of your Committee members in the Student Information System (SIS). Committee members will sign the Approval of Proposal topic section of the PhD Progress Form.

\*The Graduate School must approve all Committee members. MSU tenure-track and tenured faculty are automatically approved as Committee members. All others from inside or outside MSU can only be approved after the department Academic Coordinator obtains and submits a package of documents to The Graduate School. As this process can take considerable time, you are encouraged to obtain approval before Committee activity is anticipated.

## **8. Written Comprehensive Examination (*THIS SECTION UNDER REVISION Fall 2022. PLEASE CONSULT WITH YOUR ADVISOR*).**

As a PhD student, you are required to take a written Comprehensive Examination based on the core courses common to all three tracks.

### Expected Timeline

The examination is offered in August. If you are not prepared by the end of the first year, you may delay taking the exam until August of the third year of study at the latest.

If you fail the exam you are expected to take a remediation exam, offered only in January.

If you wish to request an exception to the above timeline for taking OR retaking the examination, you must file a written petition to the Graduate Program Committee (GPC). Your petition should document the reasons for the intended delay and must include a specific timetable for completing the exam. You must submit the petition to the GPC at least 4 months prior to the scheduled exam date. The GPC will have up to 4 weeks to either approve or deny the petition.

### Scheduling rules

If you miss the exam due to an unanticipated illness (or other non-medical problem) you must submit a medical letter (or equivalent documentation for a non-medical problem) to the GPC as soon as possible, and will be expected to take the exam on an agreed upon re-take day.

If you do not achieve a passing grade on your final opportunity to take the examination, the GPC will review your record and make a recommendation to the faculty that may involve dismissal from the PhD program.

It is your responsibility to plan your sequence of required (core) and elective courses, together with your major advisor, so that you are in the best position to succeed at the examination. The Graduate Program Director (GPD) is available to answer questions and address any concerns.

### Review of Examination Results

You are strongly encouraged to review your graded examination. You can review the exam by contacting the Academic Coordinator (AC), who will coordinate a meeting between you, your advisor and GPD if one is indicated.

## **9. Dissertation Proposal**

### Overview and Timeline

Following successful completion of your Comprehensive Examination, you should meet with your dissertation Committee to discuss your dissertation topic.

No later than the end of the fall semester of the 4th year, you must obtain signatures on the “Approval of Proposal Topic” portion of the PhD Progress Form. You must also submit a written dissertation proposal as described in this section, and deliver an oral presentation of the proposal (dissertation proposal presentation).

The dissertation research project described in the proposal must constitute original research in biostatistics of sufficient quality and depth to warrant publication after peer review.

Work on your proposal can begin at any time. You should work closely with your Committee to identify a research topic. After incorporating Committee feedback into your drafts, you are responsible for submitting the proposal to your Committee at least 3 weeks before your scheduled proposal presentation date.

You can receive no more than 6 dissertation credits (EPI 999) for dissertation proposal development before your dissertation proposal has obtained final committee approval.

### Format of the Dissertation Proposal

#### What you will prepare:

Write a **pre-doctoral grant proposal** (similar to F31) or a **cohesive document with 3 abstracts** on the subject of your dissertation research, ready for review by a granting agency or a conference abstract reviewer.

- 1) If you choose the **grant proposal** format, the grant proposal must include:
  - Specific Aims: one (1) page or less
  - Research Strategy: six (6) page maximum on “Significance, Innovation, Approach”, using typical NIH formatting requirements.
  - References: correctly formatted
  - Supplemental materials: ten (10) pages maximum
- 2) If you choose the **3-abstract** format, each abstract must include:
  - Title of the paper
  - Background literature and gap in research
  - Research question (specific aim) and the significance
  - Approach (theoretical and application) with sufficient details for Committee members to determine feasibility [minimum 500 words]
  - Innovation and impact to the field and to public health
  - References: consistently formatted
  - Supplemental materials: ten (10) pages maximum

### Dissertation Proposal Presentation (approximately 2 hours)

Once the written proposal is submitted to the Dissertation Committee, you should schedule and defend the proposal no later than the end of the spring semester of your 4<sup>th</sup> year.

- Deliver an oral presentation of your proposal in an open session and answer questions from the public audience.
- Answer further questions from the dissertation Committee in a closed session.
- The Committee will discuss and evaluate your performance, and a simple majority vote decides one of three possible outcomes:
  - a. Pass the entire Dissertation Proposal Presentation.

- b. Pass a portion of the Dissertation Proposal Presentation, necessitating partial remediation.
- c. Failure. At least two (2) members of the Committee must agree that the Dissertation Proposal Presentation was not passed to justify a failed examination. A tie vote will be regarded as a fail.
- Once your dissertation Committee decides on an outcome, you will be summoned back into the room, and your Advisor will inform you of the outcome.

## 10. PhD Dissertation Requirements

### A. PhD Dissertation Content/Format

The purpose of the PhD dissertation is to apply biostatistics training to a health issue and make a substantive contribution to the field. Two formats are acceptable for a PhD Biostatistics dissertation project. The PhD dissertation project should be substantial enough after suitable peer review to 1) yield three publishable scientific articles, or 2) be publishable as a full-length monograph by a university publishing house or other approved publishers. You are encouraged to elect the first option to expedite publication in peer-reviewed journals.

### B. Human Subjects Protection for PhD Dissertation

See <https://hrpp.msu.edu/help/graduate-student.html> (graduate student research at MSU).

If you are undertaking human subjects research you must complete MSU's online IRB training (<https://hrpp.msu.edu/training/index.html>). When applicable, your dissertation proposal should be submitted for approval to the MSU Human Research Protection Program or the corresponding animal safety committee, when the research requires use of data from or contact with human participants or animal subjects. In some instances, if you are working on data from an ongoing research project with Institutional Review Board (IRB) approval you will be asked to apply to the IRB. A copy of your IRB approval letter is required by the Graduate school at the time of final submission of your thesis or dissertation.

### C. Dissertation Defense

1. You must be enrolled for at least one credit in any course, or for dissertation credits, at the time of your defense.
2. Committee members must sign the "Approval to Defend" section of the PhD Progress form.
3. Dissertation sign-off: Present the PhD Progress Form to your Committee at your defense in-person, or electronically after the defense, and submit to the Academic Coordinator.
4. It is an MSU policy that all dissertation defenses are open to the public and all Biostatistics faculty and students are encouraged to attend.
5. You and your dissertation Advisor shall appoint one faculty member from the Department of Epidemiology and Biostatistics, who is not a dissertation committee member, to serve as an External Examiner (**EE**) at the defense. The EE shall be identified before the defense is scheduled. The EE is invited to read the dissertation prior to the defense. The role of the EE is to observe the presentation, be present

during closed door deliberations, and contribute as s/he sees fit. The EE will have no vote.

6. Your dissertation defense is scheduled to last approximately two hours, progressing through the following stages:
  - a. Committee Chair introduces all Committee members (including EE);
  - b. Student oral presentation (45 - 60 minutes);
  - c. Question/answer session open to the public;
  - d. Question/answer session with student and Committee members only;
  - e. After your temporary dismissal from the room, Committee has private deliberation and subsequent vote on your defense;
  - f. You reunite with Committee, and are informed of the Committee's decision;
  - g. Committee Chair leads a discussion regarding revisions (if any), and expected timelines for receiving revisions and final sign-off of the thesis.

#### **D. Dissertation Evaluation and Final Acceptance**

One of the following outcomes is assigned by the committee after the defense:

- Acceptable as is
- Acceptable with minor revisions
- Acceptable with major revisions
- Unacceptable

The first three outcomes constitute passing grades. Any revisions you need to incorporate should be communicated in writing by your dissertation Committee chair. You and your dissertation Committee must agree on a timeline for evaluating whether your revisions are acceptable. Your dissertation Committee may turn this task over to your dissertation Chair, or may delegate the authority to another Committee member or members.

### **11. PhD Student Timeline**

Before first semester:

- a. Meet with your Advisor to discuss your coursework plan and research interests.
- b. Initiate course equivalency/credit transfer approval process.

Between first and third year:

- c. Sit for Comprehensive examination

After successful completion of Comprehensive exam

- d. Form the dissertation Committee and prepare a written dissertation proposal.
- e. Present the dissertation proposal to the dissertation Committee. This presentation is open to the public.
- f. Complete PhD proposal approval section on the PhD Progress Form and provide to the Academic Coordinator.
- g. Enter all information in SIS (Student Information System).
- h. Obtain IRB approval if applicable.
- i. Meet with the dissertation Advisor and dissertation Committee as needed
- j. Complete the research described in the dissertation proposal and complete any additional coursework as needed.

Preparing for dissertation defense and defense (open to public, described above):

- k. The full Committee needs to agree your dissertation is defensible (recommended 6-8 weeks before defense date).
- l. You must be enrolled for at least one credit at the time of your defense.
- m. The final draft of your dissertation MUST be submitted to each Committee member at least 2 weeks before your defense date (preferably 4 weeks). Your Advisor and/or Committee members may require more time to review your dissertation.

- n. Notify the Academic Coordinator at least 2 weeks before your dissertation defense to allow time to schedule and publicize your defense.
  - o. Dissertation sign-off: Present the PhD Progress Form to your Committee at your defense in-person, or electronically after the defense, and submit to the Academic Coordinator.
- After dissertation defense:
- p. Complete any specified revisions as soon as possible (recommended within the semester). You will not receive your PhD degree until revisions are completed, your dissertation Committee Chair has signed-off, and your dissertation has been submitted to the Graduate School. You do not need to be enrolled when completing revisions or applying for graduation.
  - q. Submit **electronic** dissertation and any required IRB approval letter to the Graduate School.
  - r. Submit one **print** copy of your dissertation to the Academic Coordinator.
  - s. All requirements of your PhD Program must be completed within 8 years.

## V. DISSERTATION/THESIS SUBMISSION REQUIREMENTS

These requirements apply to both MS and PhD students.

### 1. Human Research Protection Program (Institutional Review Boards - IRB)

#### A. Research Involving Human Subjects

For information specific to graduate student research at MSU, please see:

<https://hrpp.msu.edu/help/graduate-student.html>

MSU's Human Research Protection Program (HRPP) oversees the protection of individuals who are subjects of research studies (see the HRPP website at <https://hrpp.msu.edu/contacts/about/index.html>). HRPP includes the [Institutional Review Board \(IRB\) committees](#) and the [IRB](#) and [Compliance](#) offices.

HRPP can help determine if your research activity "constitutes research and/or a clinical investigation involving human subjects" requiring IRB review (see <https://hrpp.msu.edu/help/submit/human-research.html>).

The review process begins when an investigator submits an application through the electronic CLICK system on the HRPP website. Depending on the level of risk to subjects in the protocol, HRPP assigns the protocol to one of three review categories (exempt from full review, expedited review, full review) and sends it to reviewers. Reviewers may ask for further information and documentation from the investigators. Reviewers must be satisfied that the rights and welfare of the human subjects are adequately protected before the IRB approves the application. When a proposal receives full (five-member sub-committee) review, an approval letter is issued after the proposal is discussed and approved by vote of the full committee at its monthly meeting. IRB review and approvals are in effect for a designated time period and then required to be renewed.

#### B. Research Involving Animal Subjects

The use of vertebrate animals in research, teaching, and outreach activities is subject to state and federal laws and guidelines. Please see MSU's Institutional Animal Care & Use Committee (IACUC) at <https://animalcare.msu.edu/>



The IACUC website notes: “MSU recognizes and embraces the fundamental interdependence of humans and animals and is committed to the core value of humane care and use of all animals. Animal-related activities are an integral part of MSU’s teaching, research and outreach missions and help MSU advance the quality of life for people and animals.”

Principal investigators or project directors must obtain approval from the IACUC before initiating any research, testing, or institutional project involving the use of vertebrate animals. Graduate students whose theses or dissertations include research involving vertebrate animals must provide the Graduate School with the approval number and a copy of the IACUC approval letter.

If a principal investigator or project director believes that a particular animal project does not need to be reviewed, she/he should contact the IACUC. There are several IACUC policies related to exclusion. Graduate students should request a letter from the IACUC that indicates approval of the exclusion, which can be presented to the Graduate School along with the thesis.

For the complete policy, please see the MSU Faculty Handbook:

<https://hr.msu.edu/policies-procedures/faculty-academic-staff/faculty-handbook/>.

## **2. Submission of Dissertation/Thesis**

The format of the dissertation/thesis must be in accordance with “The Graduate School Guide to the Preparation of MS Theses and Doctoral Dissertations.”

Please note, the department requires at least one print copy for the department. You can access the Graduate School guide via the following home page: <http://grad.msu.edu/etd/>.

## **3. Required Copies of Dissertation/Thesis**

You are required to submit a bound dissertation/thesis/Capstone to the department, and members of the dissertation/Thesis Committee may also require bound copies.

## **4. Microfilming and Publication of Dissertation/Thesis**

Electronic versions of all dissertations/theses will be kept by the MSU Library and by ProQuest. These electronic versions are considered by the University to be a form of publication but this does not preclude printing the thesis in whole or in part as a journal article or monograph.

# **VI. GRADUATE STUDENT RESEARCH TRAVEL AWARD REQUESTS**

MSU Travel Award application:

[https://grad.msu.edu/sites/default/files/content/funding/Travel%20Funding\\_Form\\_FS21.pdf](https://grad.msu.edu/sites/default/files/content/funding/Travel%20Funding_Form_FS21.pdf)

1. The department will make available to graduate students a Travel Award (“Award”) in the amount of \$500.00 (maximum) to present research results at a scientific conference.
2. All Awards are conditional on the availability of funds.
3. When applying for an Award, you are strongly encouraged to secure matching travel funding from another entity (e.g. CHM, The Graduate School, your Supervisor/Advisor).
4. At the time of the Award request, you must be in good academic standing based on Graduate School and departmental standing.
5. At the time of the Award request, you must be enrolled for at least one (1) credit and commence travel within one (1) semester (including summer) of the request.

6. Award requests must be submitted with 1) a copy of your accepted abstract (oral or poster) for a scientific meeting and 2) the conference notice of acceptance of your abstract. The student must be the presenting author.
7. The Award must be used for costs associated with travel consistent with allowable expenses per departmental and university travel guidelines (e.g. flight, lodging, per diem, registration). The Budget Administrator will provide students receiving an Award additional instructions based on departmental and university travel regulations.
8. Request Awards in writing by email to the Graduate Program Director and copied to the department's Budget Administrator at least 4 weeks prior to anticipated travel.

## **VII. PROCEDURES FOR GRADUATION (UNIVERSITY AND DEPARTMENTAL)**

### **1. Approval for Graduation**

You must complete-all requirements for the degree. The Academic Coordinator will verify that all requirements have been met.

### **2. Application for Graduation**

Your Application for Graduation should be submitted at the **beginning of the semester** in which your degree is to be awarded. An Application for Graduation can be found through the Office of the Registrar <https://reg.msu.edu/StuForms/GradApp/GradApp.aspx>.

## **VIII. ACADEMIC HEARING PROCEDURES FOR GRADUATE STUDENTS IN EPIDEMIOLOGY AND BIOSTATISTICS**

1. Please see our website: [https://epibio.msu.edu/students/forms/epibio\\_grievances.pdf](https://epibio.msu.edu/students/forms/epibio_grievances.pdf)