

ADMINISTRATIVE OPERATIONS GUIDE FOR THE MASTER OF SCIENCE IN ENTOMOLOGY: VECTOR-BORNE DISEASE BIOLOGY PROGRAM

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Program Background

The Master of Science in Entomology: Vector-Borne Disease Biology degree program is housed within the Cornell University Department of Entomology. This program is structured to cross-train students in the fundamentals of vector biology and public health. Over the course of 2 years, students complete required courses offered through the Department of Entomology (College of Agriculture and Life Sciences) and Master of Public Health program (College of Veterinary Medicine). Students also plan, conduct, analyze, and summarize a thesis research project based on field work conducted with regional public agency partners. The purpose of this guide is to share operational details of the NEVBD MS program with others, with the intention to support those who may start a similar program at their institution. Examples of core competency areas, course objectives, application process, summer internship, MS thesis process, timeline and evaluation materials are provided in this guide.

Additional details on the formation, structure, and evaluation of the MS Entomology: Vector-Borne Disease Biology program are reported in and may be acknowledged with the following citation:

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Degree Program Administrative Operations Guide

Applications and Enrollment

- **Target Audience.** Our goal for the MS in Entomology program in vector-borne disease biology is to provide a foundation from which graduates can immediately enter the workforce in vector surveillance, control, and related fields. A second consideration for the target audience is training diverse individuals who represent the communities served by vector-borne disease programming.
- **Application Process.** Candidates must apply to the program following the Graduate School application process as described on the Cornell Entomology website (<https://entomology.cals.cornell.edu/graduate/application-process/>). Candidates must indicate interest in the program specifically in their statement of purpose.
 - **Application Review.** The Cornell Entomology Graduate Admissions Committee will review MS program applications in the medical and veterinary entomology concentration that have been cleared by the Graduate School. A list of admissible candidates will be sent to the principal investigator for specific review.
 - **Review team.** Program Director (PD) Laura Harrington will coordinate with NEVBD Program Manager and one additional individual within the Cornell NEVBD program to review applications using a standardized review form.
 - **Review process.** Reviewers will follow a rubric containing evaluation criteria consistent with the goals of the program outlined above and the Department of Entomology. Each reviewer will then prioritize applications for acceptance and / or interviews independently; the group will reach consensus and conduct interviews as a group via Zoom platform. Reviewers will then conduct a second independent review post-interview categorizing applicants as accept, waitlist, or do not accept. The group will reach consensus, and the principal investigator will coordinate with the Entomology Department to issue acceptance / non-acceptance letters as appropriate.

Curriculum Development & Program Requirements

- **Core Competencies.** The curriculum for the program is guided by the core competencies graduates are expected to achieve, as identified by the Program Director and affiliated collaborators. The core competencies have undergone continuous review from program initiation, with feedback provided by students, instructors, and potential employers in the NEVBD network.
 - **Required courses.** Program courses have been mapped to each competency area outlined for the MS program to ensure that required courses contribute to student mastery and development (See: Competence to Coursework Crosswalk). Required courses cover a mixture of entomology and vector biology content (offered through the Entomology Department) as well as public health content (offered through the Cornell MPH Program).
 - **Student electives.** Students are encouraged to take electives that align with their career interests and personal development. Approval by PD Laura Harrington is required to enroll in electives.
 - **Master research credits.** Cornell University requires students to enroll in at least one credit hour for Master thesis research, and a minimum of 12 overall credit hours, to be considered a full-time

student and qualify for their stipend and tuition waivers. Students are encouraged to work with the Entomology Department student services representative to enroll in the required number of research credits each semester to remain in good standing, as the requirements are subject to change.

- **Summer Thesis Research.** A mandatory 10-week summer internship at a federal, state, or local health department or vector control agency is required. NEVBD will provide salary and housing support for summer internship students, as well as support for materials and supplies as is feasible.
 - **Field site selection.** The NEVBD Program Director and Program Manager work with students in their first semester to make connections with stakeholders in the NEVBD network and secure opportunities that fit the requirements of the summer thesis program. Each student should have a partnership established by the start of their second semester.
 - **Agreement forms.** NEVBD has developed an agreement form that should be signed and executed by the field site mentor, student, and Program Director should adequate documentation on partnership parameters not otherwise exist or will be required by the field site organization (See: Internship Agreement Form). This process ensures that all parties agree on the objectives, roles and responsibilities of the student and field site mentor during the internship period.
 - If a data use agreement is required for the summer internship project, Cornell University policy dictates that this agreement be executed between the field site organization and the graduate student directly.
- **Master Thesis and Committee.** Students are required by the Cornell Entomology Department and Graduate School to complete a Master Thesis and defend this thesis to complete and earn their degree.
 - **Committee members.** Students are required to select a minimum of two Cornell faculty members to serve on their committee by the end of their second semester. PD Laura Harrington is required to serve as the committee chair. The second committee member should have content expertise in the area of the student's thesis research. Per Cornell requirements, the second committee member must be of assistant professor rank or higher.
 - **Field site mentors are encouraged to participate in committee meetings and contribute to the review of student theses.** However, following Cornell guidance, they are not listed as official committee members.
- **Competency Exam.** Students are required by the NEVBD program to complete a comprehensive exam in their final semester prior to graduation covering all competencies targeted under the MS program curriculum. Students must pass this exam with a score of 75/100 or higher, which will be a component of their overall grade for the ENTOM 6540 Vector Biology in Practice capstone course.

Evaluation

- **Course evaluations.** Students complete an evaluation survey for each course they have completed in the MS program at the end of each academic semester. This survey gathers feedback on whether the courses met their stated learning objectives, how the courses compared to others taken at Cornell University, what skill(s) students learned from the courses, and how the courses can be improved.
- **Competency Self-Assessments.** Students complete four self-assessments of their proficiency level for each competency area outlined for the program (See: Student Competency Self-Assessment Questionnaire). These assessments are ideally timed at the start of each semester. Results from the

assessments are reviewed by program administration and competency gaps are incorporated in the capstone course (ENTOM 6540) to ensure students leave the program with a strong foundation in all competency areas.

- **Summer internship evaluation.** Field site mentors will be asked to complete an evaluation of student performance during the summer thesis research period (See: Field Mentor Evaluation Form). Part of this feedback will be shared directly with the student, and part of this feedback will be confidential to the NEVBD Program Director and Program Manager. The program administration will also conduct informal interviews with students to understand their experiences during the summer research period and address any issues that may prevent the successful completion of their thesis.
- **Post-Graduation Follow Up.** NEVBD Program Manager will conduct a brief survey of program graduates at 6-months post-graduation and annually thereafter, as is feasible. The survey will ask graduates to relate their most recent job title and organization, graduation year, and 1 to 3 sentences on how the MS program benefited them in either finding their current position or career performance.

Program Procedures and Timeline

APPLICATION PROCESS	J	F	M	A	M	J	J	A	S	O	N	D
Applications due to graduate school												
Graduate school screens applications												
Entomology admissions committee reviews applications												
Harrington receives admissible MS program applications												
Review team completes assessments												
Acceptance / not acceptance letters sent												
Students confirm intent to enroll												

PROGRAM ACTIVITY BY SEMSTER	S1	S2	SUMMER	S3	S4
THESIS RESEARCH					
Program administration solicit / gather internship opportunities from NEVBD network					
Students meet community partners to learn more about opportunities					
Students select field site for thesis research					
Student initiates thesis chapter 1 literature review					
Student, PI, and field mentor develop research hypothesis and project protocol					
Student confirms additional committee members at Cornell University					
Student completes all required paperwork to work at field site location / organization					
Student coordinates with PI and mentor to purchase / build needed supplies					
Student conducts summer field research following protocol					
Student continues to review literature for chapter 1 and refine methods section of chapter 2					
Student meets weekly with PI to receive guidance on project (mentor is included in some discussions)					
Student meets with committee to review progress					
Student finalizes thesis chapter 1, analyzes collected data and drafts chapter 2 (formatted for journal publication)					
Student submits thesis chapters 1 and 2 to committee for review					
Student defends thesis and submits to graduate school					
Student finalizes manuscript for submission to journal					

PROGRAM ACTIVITY BY SEMSTER	S1	S2	SUMMER	S3	S4
<i>EVALUATIONS</i>					
End-of-semester course evaluations					
Self-assessment of core competencies					
Summer internship evaluations					
Competency exam					

Competency to Coursework Crosswalk

The following competency to coursework crosswalk table is based upon the 2022 Cornell Course roster. Course names and numbers may have been updated. Course descriptions and syllabi can be found by visiting the Cornell University Course Roster: <https://classes.cornell.edu/browse/archived-rosters>.

Competency Areas of Master of Science in Entomology: Vector-Borne Disease Biology Program

1. Demonstrate understanding of arthropod biology, behavior, and taxonomy
2. Demonstrate knowledge of vector-borne pathogens of global and regional importance
3. Examine vector-borne disease prevention and control strategies and systems
4. Evaluate the impact of public health systems on vector-borne disease transmission
5. Demonstrate competence in skills as a successful public health professional and vector biologist

COMPETENCY AREA	GOAL	CORE COURSEWORK	ELECTIVE COURSEWORK
1	A. Describe arthropod biology: body plan, organ systems, physiology & immunity	- ENTOM 2120 - Insect Biology - ENTOM 4520 - Intro to Disease Vectors	
1	B. Describe mosquito and tick lifecycles and development in detail	- ENTOM 4520 - Intro to Disease Vectors - ENTOM 4521 - Intro to Disease Vectors Lab	
1	C. Describe arthropod behavior: host finding, sensory systems, infection biology and immunity	- ENTOM 2120 - Insect Biology - ENTOM 4520 - Intro to Disease Vectors - ENTOM 4521 - Intro to Disease Vectors Lab	- BIOMS 4310 - Medical Parasitology - ENTOM 4830 - Insect Physiology
1	D. Demonstrate understanding of arthropod classification, phylogeny and a solid understanding of disease vector evolutionary relationships	- ENTOM 2120 - Insect Biology - ENTOM 4520 - Intro to Disease Vectors	- BIOMI 2600 - Microbiology of Human Contagious Diseases - ENTOM 4700 - Ecological Genetics of Infection and Disease
1	E. Demonstrate arthropod identification skills, particularly those of medical importance to the level that they can be utilized to teach others	- ENTOM 2120 - Insect Biology - ENTOM 4521 - Intro to Disease Vectors Lab	
1	F. Demonstrate ability to perform arthropod collections and identify appropriate collection techniques	ENTOM 2120 - Insect Biology	

COMPETENCY AREA	GOAL	CORE COURSEWORK	ELECTIVE COURSEWORK
2	A. Identify pathogen-vector relationships of global and regional importance – including viruses, bacteria, protozoa	• ENTOM 4520 - Intro to Disease Vectors • ENTOM 4521 - Intro to Disease Vectors Lab • ENTOM 6520 - Malaria Biology and Control • VTPEH 6111 - Principles of Infectious Disease for Public Health	• BIOMI 2500 - Public Health Microbiology • BIOMI 2600 - Microbiology of Human Contagious Diseases • BIOMI 4090 - Principles of Virology • BIOMS 4310 - Medical Parasitology • ENTOM 6900 - Seminar in Ecology & Evolution of Infectious Diseases
2	B. Describe vector ecology and vector-borne disease determinants for each component of the epidemiological triad	• ENTOM 4520 - Intro to Disease Vectors • ENTOM 4521 - Intro to Disease Vectors Lab • ENTOM 6520 - Malaria Biology and Control	• BIOMS 4310 - Medical Parasitology • ENTOM 6900 - Seminar in Ecology & Evolution of Infectious Diseases
2	C. Explain symptoms of disease for several vector-borne pathogens and their impact, morbidity, and mortality	• ENTOM 4520 - Intro to Disease Vectors • ENTOM 6520 - Malaria Biology and Control • VTPEH 6111 - Principles of Infectious Disease for Public Health	• BIOMS 4310 - Medical Parasitology
2	D. Describe the ecology of major invasive vectors and factors that lead to their invasion	• ENTOM 4520 - Intro to Disease Vectors • ENTOM 4521 - Intro to Disease Vectors Lab • ENTOM 6520 - Malaria Biology and Control • ENTOM 6530 - Control of Disease Vectors	• ENTOM 6900 - Seminar in Ecology & Evolution of Infectious Diseases
2	E. Explain the demonstrated and future potential impact of climate change on vector-borne disease ecology and risk	• ENTOM 4520 - Intro to Disease Vectors • ENTOM 4521 - Intro to Disease Vectors Lab • ENTOM 6520 - Malaria Biology and Control • ENTOM 6540 - Vector Biology in Practice	• ENTOM 6900 - Seminar in Ecology & Evolution of Infectious Diseases
2	F. Explain key epidemiological concepts in vector-borne diseases, demonstrate an understanding of how they are measured	• ENTOM 4520 - Intro to Disease Vectors • ENTOM 4521 - Intro to Disease Vectors Lab • ENTOM 6520 - Malaria Biology and Control • VTPEH 6104 - Epidemiology in Practice	• BIOMS 4310 - Medical Parasitology
2	G. Explain human and arthropod surveillance systems for regional, national, and international vector-borne infections	• ENTOM 4520 - Intro to Disease Vectors • ENTOM 6530 - Control of Disease Vectors	
2	H. Explain best practices for conducting vector and pathogen surveillance and demonstrate surveillance techniques for mosquitoes and ticks	• ENTOM 6530 - Control of Disease Vectors • ENTOM 8900 - Master level thesis research	
2	I. Perform standard analysis of surveillance data	• ENTOM 6540 - Vector Biology in Practice • VTPEH 6104 - Epidemiology in Practice	• NTRES 6200 - Spatial Modeling and Analysis
2	J. Interpret human and arthropod surveillance data	• ENTOM 6540 - Vector Biology in Practice	• NTRES 6200 - Spatial Modeling and Analysis

COMPETENCY AREA	GOAL	CORE COURSEWORK	ELECTIVE COURSEWORK
3	A. Explain the history of vector control and emerging technology strategies	• ENTOM 4520 - Intro to Disease Vectors • ENTOM 4521 - Intro to Disease Vectors Lab • ENTOM 6520 - Malaria Biology and Control • ENTOM 6530 - Control of Disease Vectors	
3	B. Explain regulation of insecticides in the US and NY and the Northeast, label information, safety, and personal protection	• ENTOM 6530 - Control of Disease Vectors	• ENTOM 4440 - Integrated Pest Management
3	C. Relate knowledge of alternate control strategies; genetic, behavioral, acoustic, and visual/olfactory approaches; spatial repellents and push-pull systems; describe pros and cons and sociocultural considerations for each	• ENTOM 6520 - Malaria Biology and Control • ENTOM 6530 - Control of Disease Vectors	• BIOMI 2500 - Public Health Microbiology • ENTOM 4900 - Toxicology of Insecticides
3	D. Demonstrate operational knowledge of the current state of insecticide control efforts and knowledge regarding insecticide resistance and methods for resistance monitoring	• ENTOM 6520 - Malaria Biology and Control • ENTOM 6530 - Control of Disease Vectors	• ENTOM 4440 - Integrated Pest Management • ENTOM 4700 - Ecological Genetics of Infection and Disease
3	E. Create public education resources and implement programs targeted at the reduction in the incidence of vector-borne diseases	• ENTOM 6530 - Control of Disease Vectors • ENTOM 6540 - Vector Biology in Practice • VTPEH 6184 - Public Health Practice: Communication	• NTRES 6200 - Spatial Modeling and Analysis
4	A. Describe structure of health systems and essential public health functions at regional and national levels	• VTPEH 6101 - Public Health Foundations I • VTPEH 6102 - Public Health Foundations II	• PAM 4140 - Global Health Economics and Policy
4	B. Demonstrate understanding of personal leadership strengths and areas for growth as well as tools to accomplish growth	• ENTOM 6540 - Vector Biology in Practice • ENTOM 7670 - Professional Development in Entomology • ENTOM 8900 - Master level thesis research	• VTPEH 6103 - Public Health Ethics & Leadership • VTPEH 6182 - Public Health Practice - Planning
4	C. Implement effective communication strategies and leadership in collaborations and diverse team-based organizations	• ENTOM 8900 - Master level thesis research • VTPEH 6101 - Public Health Foundations I • VTPEH 6102 - Public Health Foundations II	• VTPEH 6103 - Public Health Ethics & Leadership • VTPEH 6182 - Public Health Practice - Planning
4	D. Demonstrate understanding of sociology and psychology as it relates to health prevention and public communication efforts	• VTPEH 6101 - Public Health Foundations I • VTPEH 6102 - Public Health Foundations II • VTPEH 6184 - Public Health Practice: Communication	• PAM 4140 - Global Health Economics and Policy

COMPETENCY AREA	GOAL	CORE COURSEWORK	ELECTIVE COURSEWORK
4	E. Demonstrate a clear understanding of ethical practices in science and public health, including application of ethical principles in collecting, analyzing, maintaining, and disseminating data	• ENTOM 6540 - Vector Biology in Practice • ENTOM 7670 - Professional Development in Entomology • VTPEH 6101 - Public Health Foundations I • VTPEH 6102 - Public Health Foundations II • VTPEH 6104 - Epidemiology in Practice • IRB and IACUC certifications	• VTPEH 6103 - Public Health Ethics & Leadership
5	1. Display effective oral and written communication skills, including competent strategies for communicating vector biology and disease risk to multiple audiences (peers and public) and understanding of best practices for public health messaging	• ENTOM 4520 - Intro to Disease Vectors • ENTOM 6540 - Vector Biology in Practice • VTPEH 6101 - Public Health Foundations I • VTPEH 6102 - Public Health Foundations II • VTPEH 6184 - Public Health Practice: Communication	• VTPEH 6103 - Public Health Ethics & Leadership • VTPEH 6182 - Public Health Practice - Planning
5	2. Utilize health models for program planning, implementation, evaluation	• ENTOM 6540 - Vector Biology in Practice • VTPEH 6101 - Public Health Foundations I • VTPEH 6102 - Public Health Foundations II	• PAM 4140 - Global Health Economics and Policy • VTPEH 6182 - Public Health Practice and Planning • NTRES 6200 - Spatial Modeling and Analysis
5	3. Apply and defend the components of rigorous experimental design and data analysis	• ENTOM 6540 - Vector Biology in Practice • ENTOM 8900 - Master thesis level research • VTPEH 6104 - Epidemiology in Practice • VTPEH 6105 - Biostatistics for Health Sciences	• VTPEH 6182 - Public Health Practice - Planning
5	4. Develop recommendations for implementation of policies, programs, and services based on current and projected trends of vector-borne diseases	• ENTOM 6540 - Vector Biology in Practice	• PAM 4140 - Global Health Economics and Policy • VTPEH 6182 - Public Health Practice - Planning
5	5. Evaluate policies, programs, and services, and provide technical expertise	• ENTOM 4520 - Intro to Disease Vectors • ENTOM 6530 - Control of Disease Vectors • ENTOM 6540 - Vector Biology in Practice • VTPEH 6101 - Public Health Foundations I • VTPEH 6102 - Public Health Foundations II	

COMPETENCY AREA	GOAL	CORE COURSEWORK	ELECTIVE COURSEWORK
5	6. Disseminate data and information to health professionals and the public using a variety of approaches and ensure the diversity of individuals and populations is addressed	• ENTOM 4520 - Intro to Disease Vectors • ENTOM 6540 - Vector Biology in Practice • VTPEH 6101 - Public Health Foundations I • VTPEH 6102 - Public Health Foundations II • VTPEH 6184 - Public Health Practice: Communication	• NTRES 6200 - Spatial Modeling and Analysis
5	7. Describe the roles and responsibilities of governmental and non-governmental organizations in providing programs and services at local, national, and global level	• VTPEH 6101 - Public Health Foundations I • VTPEH 6102 - Public Health Foundations II	• PAM 4140 - Global Health Economics and Policy
5	8. Apply public health sciences (e.g., biostatistics, epidemiology, environmental health sciences) in the delivery of the following Essential Public Health Services: a. Diagnose and investigate health problems and health hazards in the community; b. Inform, educate, and empower people about health issues; c. Mobilize community partnerships to identify and solve health problems; d. Develop policies and plans that support individual and community health efforts; e. Evaluate effectiveness, accessibility, and quality of personal and population-based health services; and f. Research for new insights and innovative solutions to health problems	• VTPEH 6104 - Epidemiology in Practice • VTPEH 6105 - Biostatistics for Health Sciences • VTPEH 6184 - Public Health Practice: Communication • ENTOM 6530 - Control of Disease Vectors • ENTOM 6540 - Vector Biology in Practice	

In addition, students take two online courses offered through eCornell during their first year ([Vector-borne Diseases Surveillance](#) and [Biology of Mosquitoes, Ticks, and Other Disease-Causing Arthropods](#)). These courses support competency areas 1,2 and 5.

Internship Agreement Form

MS in Entomology Program – Graduate Student Summer Internship

The NEVBD supports a Master of Science in Entomology program offered at Cornell University featuring an updated curriculum integrating vector biology and public health. Each student enrolled in our MS program is required to complete a 10-week summer internship with a regional partner (some students return to their field site or work longer than 10 weeks). NEVBD will provide financial support to the student interns across the 10-week internship period, including a weekly stipend, health insurance, housing and transportation assistance, and a modest amount of support for the purchase of research supplies.

Goal of the Internship:

Engage students in hands-on activities in which they use tools and skills in public health and/or vector biology in a real-world setting. Students will learn and improve their skills through engagement, practice, and mentorship. Students will conduct research through this summer internship experience that will form the basis of their graduate thesis.

Expectations of our students:

Our students are expected to work with their internship site mentor and NEVBD Cornell advisors to plan and implement a project that is of mutual value during the spring semester prior to their 10-week summer internship period. Students are expected to develop a product of benefit to the internship site mentor by the conclusion of the 10-week internship period. Examples of products can include completion of data collection and analysis, generation of reports or public-facing materials, delivery of services, and others. Students will track the progress of their internship through regular meetings with their internship preceptors and NEVBD Cornell advisors.

Expectations of Internship Preceptors:

A successful internship will start with a meeting between the internship site mentor, the student and their NEVBD Cornell advisors to plan the research project, develop the research plan, and implement a project that is of mutual value in advance of the 10-week internship period. The internship site mentor is expected to help the student obtain any requisite permissions, worksite accommodations, and complete other paperwork in order to work at their facility well in advance of the 10-week summer internship start date. The internship site mentor will also provide regular on-site supervision and mentoring to the student during the 10-week summer internship period, and support a safe and positive working environment for the student. The internship site mentor should expect to communicate with the NEVBD advisors to address any issues with student performance and assist the student with participating in activities of engagement and practice during the 10-week summer internship period. The internship site mentor will also complete a brief evaluation of student performance after the 10-week internship period has concluded.

Student/Supervisor Internship Agreement

This agreement is made on [Click or tap to enter a date.](#) between (Internship Site Mentor) [Click or tap here to enter text.](#), the Northeast Regional Center for Excellence in Vector-Borne Diseases (NEVBD), and [Click or tap here to enter text.](#) (Student). This agreement is made solely for Student's 10-week summer internship with Internship Site Mentor. No other relationship, partnership, responsibilities, or rights are created, implied, or affirmed by this Agreement. This Agreement will be in effect for the summer internship period under the following dates: [Click or tap to enter a date.](#) to [Click or tap to enter a date.](#)

NEVBD agrees to the following responsibilities:

- Provide financial support for Student across internship period, including weekly stipend, health insurance, housing and transportation assistance, and a modest amount of support for purchase of research supplies.
- Coordinate the development of internship expectations and targeted outcomes with Internship Site Mentor and Student in spring prior to initiation of the 10-week summer internship period.
- Coordinate with Internship Site Mentor for any data use agreements or other approvals between Cornell University and Internship Site Mentor necessary for Student to complete internship work or objectives.
- Work with Internship Site Mentor to address any concerns on performance of Student during summer internship period.

Student agrees to the following responsibilities:

- Communicate with Internship Site Mentor and NEVBD Cornell advisors to select a research project, develop a research plan and implement a project that is of mutual value.
- Work with Internship Site Mentor to develop internship expectations and targeted outcomes in spring prior to initiation of the 10-week summer internship period.
- Provide weekly written updates on their progress to both Internship Site Mentor and NEVBD MS program advisors.
- Complete all requisite training and permissions prior to the internship period, if possible.
- Arrange for purchase of materials and equipment for their project (supported by NEVBD) and make transportation & housing arrangements prior to the internship period.
- Participate in activities of engagement and practice and produce a product of benefit to the host organization. Student will be expected to devote time to assist Internship Site Mentor with ongoing activities during the internship period outside the scope of their primary project.
- Act in accordance with the highest ethical standards of professional practice as defined by the relevant practices, policies, rules, or regulations within the Internship Site organization.
- Actively seek assistance from either or both NEVBD Cornell advisors and Internship Site Mentor during the internship period.

Internship Site Mentor agrees to the following responsibilities:

- Meet with Student and their NEVBD Cornell advisors to plan the research project, develop the research plan, and implement a project that is of mutual value in advance of the 10-week internship period.
- Help Student obtain any requisite permissions, worksite accommodations, and complete other paperwork in order to work at the Internship Site Mentor's facility well in advance of the 10-week summer internship start date.
- Provide regular on-site supervision and mentoring to Student during the 10-week summer internship period, and support a safe and positive working environment for Student.
- Communicate with the NEVBD advisors to address any issues with student performance.
- Assist Student with participating in activities of engagement and practice during the 10-week summer internship period. The Internship Site Mentor will ensure that time spent by Student on additional activities outside the scope of their primary project does not impede the ability of Student to complete their primary objectives.
- Complete a brief evaluation of Student's performance after the 10-week internship period has concluded.

The terms above reflect the minimal expectations of the internship experience. On occasion, special circumstances will require some modification of the Agreement terms. If the Internship Site Mentor believes there are special circumstances that would require modification of this Agreement, please state these modifications in the space provided below:

Click or tap here to enter text.

Please provide a concise description of the intended summer internship work plan and targeted objectives in the space provided below:

Click or tap here to enter text.

By signing below, I acknowledge that I have reviewed the internship expectations outlined above and I am able to meet these requirements.

Student:

First Name: Click or tap here to enter text. Last Name: Click or tap here to enter text.

Email: Click or tap here to enter text.

Signature: Click or tap here to enter text. Date: Click or tap to enter a date.

NEVBD:

First Name: Click or tap here to enter text. Last Name: Click or tap here to enter text.

Email: Click or tap here to enter text.

Signature: Click or tap here to enter text. Date: Click or tap to enter a date.

Internship Site Mentor:

First Name: Click or tap here to enter text. Last Name: Click or tap here to enter text.

Email: Click or tap here to enter text.

Position Title: Click or tap here to enter text.

Facility Location Street Address: Click or tap here to enter text.

City: Click or tap here to enter text. **State:** Click or tap here to enter text.

Zip: Click or tap here to enter text.

Signature: Click or tap here to enter text.

Date: Click or tap to enter a date.

Please return this signed commitment form to NEVBD Program Manager Emily Mader (emm367@cornell.edu) prior to the start of the 10-week summer internship period. All parties will receive a copy of the fully executed agreement for their records.

Field Mentor Evaluation Form

First, let us say thank you for hosting one of our MS in Entomology students from the NEVBD and Cornell University. We sincerely appreciate the opportunity offered to our students through this partnership, and appreciate your contribution to their learning experience.

We are hoping to learn more about your experience working with our graduate student through this summer internship program. Your feedback will not only help us provide academic and professional development support to our students, but will also help us strengthen this internship program overall.

This brief evaluation is broken into two sections: the first will seek feedback specifically about your student intern, and the second will seek feedback on your overall experience working with the NEVBD in this internship program.

Please note: we will share some of your feedback about student performance directly with our students to help them grow as future professionals in the field. Your candid feedback is very important to us for this reason. We also provide an opportunity for you to provide confidential feedback that will not be shared with the student.

Thank you again for providing this wonderful opportunity to our students and helping us improve our program!

Best,
Laura & Emily

Laura C. Harrington, PhD
Program Director
lch27@cornell.edu

Emily M. Mader, MPH MPP | she/her
Program Manager
emm367@cornell.edu

Northeast Regional Center for Excellence in Vector-Borne Diseases

1. Please enter the name of your student intern:
2. Were you this student's primary supervisor for the summer internship experience?
 - ☐ Yes
 - ☐ No

The following questions will ask directly about the performance of your student intern and your experience working with them in this internship program. It is our intention to share a summary of this feedback with the student to inform them of their **professional** development. You will have an opportunity to provide confidential feedback in a later part of the survey, which will not be shared with the intern.

3. Please rank your student intern's performance on the following items using the following scale:
 - 5 - Outstanding** - Performance is exceptional in all areas and is clearly superior to others.
 - 4 - Very Good** - Results clearly exceed most position requirements. Performance is of high quality and is achieved on a consistent basis.
 - 3 - Good** - Competent levels of performance that consistently meet job standards.

2 - Improvement Needed - Performance is deficient in certain areas and improvement is needed.

1 - Unsatisfactory - Results are generally unacceptable and require immediate improvement.

	Outstanding	Very Good	Good	Improvement Needed	Unsatisfactory
Communication: Demonstrates the ability to speak, listen, read and write in performing job tasks	☐	☐	☐	☐	☐
Problem solving: Identifies problems, understands their context, and develops workable solutions	☐	☐	☐	☐	☐
Time Management: Completes assigned tasks from start to finish using good time management skills	☐	☐	☐	☐	☐
Professionalism: Meets workplace standards on confidentiality, flexibility, appearance, and making a good impression	☐	☐	☐	☐	☐
Interactions with Others: Works professionally and respectfully with a diversity of co-workers and supervisors, resolving conflicts in a constructive manner	☐	☐	☐	☐	☐
Quality of Work: Performance of tasks is of high quality, generally error free or with few errors	☐	☐	☐	☐	☐
Attitude: Shows enthusiasm and a positive attitude for the job and in successfully completing all assigned work	☐	☐	☐	☐	☐
Dependability: Maintains consistently excellent record of attendance, communication, and reliability in meeting work responsibilities	☐	☐	☐	☐	☐

4. What are the student's greatest strengths?

5. What are areas the student should focus on for improvement?

The following questions will ask about your general experience working with the NEVBD in this internship program. You can use this space to provide confidential feedback on the student and larger program.

6. How would you rank your overall experience mentoring an NEVBD graduate student this summer?

- ☐ Extremely dissatisfied
- ☐ Somewhat dissatisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat satisfied
- ☐ Extremely satisfied

7. How useful was working with an NEVBD graduate student to your program?

- ☐ Not at all useful
- ☐ Slightly useful
- ☐ Moderately useful
- ☐ Very useful
- ☐ Extremely useful

8. Please indicate how hosting your NEVBD graduate student helped advance your program's goals (if any; select all that apply):

- ☐ Increased knowledge within our program/personnel
- ☐ Contributed expertise not otherwise available within our current program
- ☐ Provided an enduring resource(s) to our program
- ☐ Expanded the ability of our program to conduct valuable work
- ☐ Other (please specify):
- ☐ None

9. What unintended or unforeseen obstacles did you encounter to hosting your student intern (select all that apply):

- ☐ Difficulty in organizational onboarding
- ☐ Access to software or database systems
- ☐ Access to necessary supplies for project
- ☐ Administrative and/or legal challenges to project implementation
- ☐ Transportation barriers or challenges
- ☐ Gap in student intern skills or knowledge
- ☐ Inconsistent communication with NEVBD personnel
- ☐ Interpersonal communication issues
- ☐ Other (please specify):
- ☐ None

10. [if 'none' to Q9 is not selected] Please provide additional feedback on how these obstacles affected this internship:

11. Please rate the quality of the following components of the internship program:

	Excellent	Average	Terrible
Matching your project with an NEVBD graduate student intern	☐	☐	☐
Coordination with NEVBD program administration on internship logistics	☐	☐	☐
Communication with NEVBD program administration	☐	☐	☐
Explanation of expectations for student intern performance	☐	☐	☐
Explanation of expectations for mentor in the internship program	☐	☐	☐

12. Would you be interested in mentoring an NEVBD graduate student summer intern again?

- ☐ Yes
- ☐ Maybe
- ☐ No

13. How can NEVBD improve our summer internship program? This can include any aspect of the program, such as the mentor-student placement process or explanations of internship expectations. Your candid feedback is essential to our ability to improve this program.

14. Please use the space below to share any feedback about your student intern that you would like to remain confidential to the NEVBD administration.

Student Competency Self-Assessment Questionnaire

The following survey features each of the five core competency areas targeted by the curriculum and activities of the Master of Science in Entomology - Vector-borne Disease Biology Program. We are asking each of our currently-enrolled MS students to complete this survey in an effort to help program administration understand your experience working through this program, and tailor upcoming coursework to be responsive to your learning needs.

You will be asked to rate the degree to which you feel competent or proficient in targeted areas using the following scale:

- **Extremely competent** - I feel confident in my personal mastery of this topic area
- **Somewhat competent** - I feel adequately introduced to this topic area and can conduct self-directed supplemental learning as needed
- **Neither competent nor incompetent** - I am familiar with this topic but have yet to assess my level of content mastery
- **Somewhat incompetent** - I am familiar with this topic area, but would benefit from additional training
- **Extremely incompetent** - I am not familiar with this topic area or have limited mastery and require training

This survey should take 5 - 10 minutes to complete.

1. NetID:
2. The following items capture professional competencies related to your **understanding of arthropod biology, behavior and taxonomy**. Please rate the degree to which you feel competent or proficient in the following areas:

	Extremely competent	Somewhat competent	Neither competent nor incompetent	Somewhat incompetent	Extremely incompetent
Describe arthropod biology: body plan, organ systems, physiology & immunity	☐	☐	☐	☐	☐
Describe mosquito and tick lifecycles and development in detail	☐	☐	☐	☐	☐
Describe arthropod behavior: host finding, sensory systems, infection biology and immunity	☐	☐	☐	☐	☐
Demonstrate understanding of arthropod classification, phylogeny a solid understanding of disease vector evolutionary relationships	☐	☐	☐	☐	☐
Demonstrate arthropod identification skills, particularly those of medical importance to the level that they can be utilized to teach others	☐	☐	☐	☐	☐
Demonstrate ability to perform arthropod collections and identify appropriate collection techniques	☐	☐	☐	☐	☐

3. Please use the space below to provide any additional comments or recommendations on the incorporation or development of additional coursework to bolster your educational experience in the above-listed competency areas:

4. The following items capture professional competencies related to your **knowledge of vector-borne pathogens of global and regional importance**. Please rate the degree to which you feel competent or proficient in the following areas:

	Extremely competent	Somewhat competent	Neither competent nor incompetent	Somewhat incompetent	Extremely incompetent
Identify pathogen-vector relationships of global and regional importance – including viruses, bacteria, protozoa	☐	☐	☐	☐	☐
Describe vector ecology and vector-borne disease determinants for each component of the epidemiological triad	☐	☐	☐	☐	☐
Explain symptoms of disease for several vector-borne pathogens and their impact, morbidity, and mortality	☐	☐	☐	☐	☐
Describe the ecology of major invasive vectors and factors that lead to their invasion	☐	☐	☐	☐	☐
Explain the demonstrated and future potential impact of climate change on vector-borne disease ecology and risk	☐	☐	☐	☐	☐
Explain key epidemiological concepts in vector-borne diseases, demonstrate an understanding of how they are measured	☐	☐	☐	☐	☐
Explain human and arthropod surveillance systems for regional, national, and international vector-borne infections	☐	☐	☐	☐	☐
Explain best practices for conducting vector and pathogen surveillance and demonstrate surveillance techniques for mosquitoes and ticks	☐	☐	☐	☐	☐
Perform standard analysis of surveillance data	☐	☐	☐	☐	☐
Interpret human and arthropod surveillance data	☐	☐	☐	☐	☐

5. Please use the space below to provide any additional comments or recommendations on the incorporation or development of additional coursework to bolster your educational experience in the above-listed competency areas:

6. The following items capture professional competencies related to your **ability to examine vector-borne disease prevention, and control strategies and systems**. Please rate the degree to which you feel competent or proficient in the following areas:

	Extremely competent	Somewhat competent	Neither competent nor incompetent	Somewhat incompetent	Extremely incompetent
Explain the history of vector control and emerging technology strategies	☐	☐	☐	☐	☐
Explain regulation of insecticides in the US and NY and the Northeast, label information, safety, and personal protection	☐	☐	☐	☐	☐

Relate knowledge of alternate control strategies; genetic, behavioral, acoustic and visual/olfactory approaches; spatial repellents; and push-pull systems; describe pros and cons and sociocultural considerations for each	☐	☐	☐	☐	☐
Demonstrate operational knowledge of the current state of insecticide control efforts and knowledge regarding insecticide resistance and methods for resistance monitoring	☐	☐	☐	☐	☐
Create public education resources and implement programs targeted at the reduction in the incidence of vector-borne disease	☐	☐	☐	☐	☐

7. Please use the space below to provide any additional comments or recommendations on the incorporation or development of additional coursework to bolster your educational experience in the above-listed competency areas:
8. The following items capture professional competencies related to your **ability to evaluate the impact of public health systems on vector-borne disease transmission**. Please rate the degree to which you feel competent or proficient in the following areas:

	Extremely competent	Somewhat competent	Neither competent nor incompetent	Somewhat incompetent	Extremely incompetent
Describe structure of health systems and essential public health functions at regional and national levels	☐	☐	☐	☐	☐
Demonstrate understanding of personal leadership strengths and areas for growth as well as tools to accomplish growth	☐	☐	☐	☐	☐
Implement effective communication strategies and leadership in collaborations and diverse team-based organizations	☐	☐	☐	☐	☐
Demonstrate understanding of sociology and psychology as it relates to health prevention and public communication efforts	☐	☐	☐	☐	☐
Demonstrate a clear understanding of ethical practices in science and public health, including application of ethical principles in collecting, analyzing, maintaining, and disseminating data	☐	☐	☐	☐	☐

9. Please use the space below to provide any additional comments or recommendations on the incorporation or development of additional coursework to bolster your educational experience in the above-listed competency areas:

10. The following items capture professional competencies related to your **ability to demonstrate competence in skills as a successful public health professional and vector biologist**. Please rate the degree to which you feel competent or proficient in the following areas:

	Extremely competent	Somewhat competent	Neither competent nor incompetent	Somewhat incompetent	Extremely incompetent
Display effective oral and written communication skills, including competent strategies for communicating vector biology and disease risk to multiple audiences (peers and public) and understanding of best practices for public health messaging	☐	☐	☐	☐	☐
Utilize health models for program planning, implementation, evaluation	☐	☐	☐	☐	☐
Apply and defend the components of rigorous experimental design and data analysis	☐	☐	☐	☐	☐
Develop recommendations for implementation of policies, programs, and services based on current and projected trends of vector-borne diseases	☐	☐	☐	☐	☐
Evaluate policies, programs, and services, and provide technical expertise	☐	☐	☐	☐	☐
Disseminate data and information to health professionals and the public using a variety of approaches to ensure the diversity of individuals and populations is addressed	☐	☐	☐	☐	☐
Describe the roles and responsibilities of governmental and non-governmental organizations in providing programs and services at the local, national, and global level	☐	☐	☐	☐	☐
Apply public health sciences (e.g., biostatistics, epidemiology, environmental health sciences) in the delivery of the 10 Essential Public Health Services	☐	☐	☐	☐	☐

11. Please use the space below to provide any additional comments or recommendations on the incorporation or development of additional coursework to bolster your educational experience in the above-listed competency areas:
12. Please use the space below to provide any additional feedback about your educational experience in the MS Entomology - Vector-Borne Disease Biology Program:
13. Please take a moment to review your answers. If you are satisfied with your responses, please hit 'next' below. Thank you for taking the time to complete this form.