

Graduate Group in Epidemiology Guidelines

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A. GGE and Academic Information

Abbreviations

ARE	Agricultural & Resource Economics
BST	Graduate Group in Biostatistics
CLH	Clinical Research
CMN	Communication
CRN	Course Registration Number
EGGS	Epidemiology Graduate Group Students
ECN	Economics
ECI	Engineering: Civil and Environmental
EDU	Education
ENT	Entomology
EPI	Epidemiology
ETX	Environmental Toxicology
GGE	Graduate Group in Epidemiology
GSR	Graduate Student Researcher
HDE	Human Development
MIC	Microbiology
MHI	Health Informatics
MIC	Microbiology
MMI	Medical Microbiology & Immunology
NPB	Neurobiology, Physiology, and Behavior
NRS	Nursing
NUT	Nutrition
PELP	Planned Education Leave Program
PHR	Population Health & Reproduction
PSY	Psychology
PTX	Pharmacology and Toxicology
QE	Qualifying Examination
STA	Statistics
TA	Teaching Assistant
TAPS	Transportation and Parking Services
VME	Veterinary Medicine & Epidemiology
WFC	Wildlife, Fisheries, & Conservation Biology

Registration (SISWEB)

It is best that you plan out your class schedule as soon as possible and be prepared to register for fall quarter by late August/early September. In addition to the classes offered by the Graduate Group, many elective classes are offered outside of the GGE as well. The best resource for the variety of classes offered at the university is the course catalog. You may purchase a hard copy from the [UCD Bookstore](#) or you may view it [online](#).

You can register for your classes online using [SISWEB](#). You may access your account (MyAccount) and register for classes (Schedule Builder). Course registration numbers (CRN) can be found on the GGE website (or on the registrar's website through SISWEB). For other

elective classes offered outside of the GGE, you will need to contact the professor who is teaching the class for permission to add the course and the CRN number. To be registered as a full time student, you MUST sign-up for a minimum of 12 units per quarter. Upon completion of coursework you will register for 12 units of research with your Major Professor. These units are referred to as 299 units and you must ask for a new 299 CRN each quarter.

Graduate Advisor

A graduate advisor will be assigned to you in the GGE, based on your area of interest; either in human medicine, veterinary medicine, or another area. Graduate advisors are available to help you find elective courses and track your progress throughout the program. If you have any questions about the coursework, electives, examination and thesis/dissertation research contact your graduate advisor. Be sure to meet with your graduate advisor at least once a quarter for the first few quarters of your graduate program.

Peer Advisor

The Epidemiology Graduate Group Students (EGGS) group implemented a peer advisor program and it has proven to be quite successful. The purpose of the peer advisor program is to provide each new GGE graduate student another resource person to approach with questions. This was also the objective of this handbook, but every question a new student has may not be addressed here. Once a prospective student has accepted admission to the GGE, s/he will be paired up with a current GGE graduate student. Your peer advisor, in addition to your graduate advisor and guidance committee, can help you select classes and refer you to appropriate faculty with similar research interests. Your peer advisor can also help you with questions regarding the campus, the city, and anything a person new to the area might need to know.

Faculty Mentor

A faculty mentor will be assigned to the new student by the master graduate advisor after consulting with the student. Students are required to have a mentor by the end of fall quarter. No formal paperwork needs to be filed with Graduate Studies – the Graduate Group coordinator just needs to be provided with the name of the mentor assigned to each student. The main responsibility of the faculty advisor is to answer education-related questions and help with class selection. It is very important that students meet with their assigned mentor who can help them choose electives, coordinate early stages of their program, and become established in an appropriate laboratory or research program. There is no requirement that the faculty advisor later become a member of the dissertation (PhD), thesis (MS), or examination (MS) committees.

Major Professor

You should find a major professor as soon as possible. Think about the areas of interest you have and contact faculty in those areas before the fall quarter begins. Faculty members in the Graduate Group can be found through the [GGE website](#). The website briefly outlines their activities on campus and their research interests, as well as provides a link to the faculty home page where more in-depth information regarding their research area may be found.

The role of the major professor is very important. They will guide you throughout the program and into your research project. They will also act as the chair of your guidance committee and

are crucial in securing funding for your dissertation project. Remember, you are interviewing the professor; the professor is not interviewing you. Finding a major professor that fits your needs as soon as possible will ensure that you meet goals within the targeted timeline. Also, do not feel the need to apologize for making an appointment to meet with your major professor or any other professor at UCD. Professors are here to help graduate students with their studies and research.

Funding

Current graduate students have tapped into several main sources of funding. They include serving as a Teaching Assistant (TA) or Graduate Student Researcher (GSR), being awarded a fellowship, and writing your own grant(s). By far the most common route is the TA/GSR, especially in the first two years. Your major professor is the best resource to use to find a position as a GSR. If you work 25% time, your in-state tuition, fees, and student health insurance are covered by your employer/faculty member; however the GGE Compensation Plan requires GSR positions be at least 47% time. The [Office of Graduate Studies website](#) is an excellent site to visit for more information. As these positions are competitive, be sure to apply by June for positions in the fall. In addition, the GGE awards block grants for top first year and second year students. The Office of Graduate Studies [website](#) contains a list of fellowships offered to new and continuing students every year. Criteria for fellowships vary for each specific fellowship. This is THE place to start looking for fellowships for which applications are due January 15th of each year.

Course Information

The Graduate Group in Epidemiology has both MS and PhD tracks. Please see the [Degree Requirements](#) for full course information, including prerequisites, core courses for both MS and PhD programs, and electives.

Elective Courses: Electives should be selected based on the student's chosen Area of Interest (nine units) plus, for doctoral students and master's students doing a thesis, three additional units from among graduate courses in epidemiology and statistics. Areas of Interest include infectious disease epidemiology; health services and health economics; epidemiologic methods and biostatistics; occupational and environmental epidemiology; nutritional epidemiology; wildlife epidemiology; zoonotic and vectorborne diseases; reproductive, perinatal, developmental and pediatric epidemiology; and social and behavioral epidemiology. Courses come and go so be sure the elective(s) you wish to take are still offered. In conjunction with your Major Professor and Adviser, you may identify courses not listed in our Area of Interest course list that are applicable to your program. The campus is big and there is a wide array of interesting courses that we may not know of so do not hesitate to look at relevant departmental offerings. Courses must be in the 200 series to apply towards a graduate degree.

Seminar: A seminar is offered every other week each quarter (0.5 units per quarter). Students are required to enroll in the seminar until advancement to candidacy (usually three quarters for master's students, six for doctoral students).

A typical timeline and sequence of events for both Masters and PhD students is listed below, and is also outlined in more detail in the [GGE Degree Requirements](#) online.

Masters:

For students who have not completed prerequisites (sample):

	Summer	Fall	Winter	Spring
Year 1	Prereqs: MAT 16A or MAT 21A MPM 402	EPI 205 EPI 290 MAT 16B or MAT 21B MPM 403 or STA 102	EPI 206 EPI 290 Elective(s) STA 106	EPI 207 EPI 290 Elective(s) STA 108
Year 2		EPI 202 EPI 290 STA 144* Elective(s)	EPI 203 EPI 290 PHR 202* Elective(s)	EPI 204 EPI 290 PHR 266** Elective(s)
Year 3	Thesis research or Comprehensive Examination	EPI 208** Thesis research or Comprehensive Examination	Thesis research	Thesis research

For students who have completed prerequisites (sample):

	Summer	Fall	Winter	Spring
Year 1		EPI 202 EPI 205 EPI 290 STA 144* Elective(s)	EPI 203 EPI 206 EPI 290 PHR 202* Elective(s)	EPI 204 EPI 207 EPI 290 PHR 266**
Year 2		EPI 202 EPI 290 STA 144* Elective(s)	EPI 203 EPI 290 PHR 202* Elective(s)	EPI 204 EPI 290 PHR 266** Elective(s)
Year 3	Thesis research or Comprehensive Examination	EPI 208** Thesis research or Comprehensive Examination	Thesis research	Thesis research

*Either PHR 202 or STA 144 must be taken.

**Either PHR 266 or EPI 208 must be taken.

PhD:

For students who have not completed prerequisites (sample):

	Summer	Fall	Winter	Spring
Year 1	Prereqs: MAT 16A or MAT 21A MPM 402	EPI 205 EPI 290 MAT 16B or MAT 21B MPM 403 or	EPI 206 EPI 290 Elective(s)	EPI 207 EPI 290 Elective(s)

		STA 102	STA 106	STA 108
Year 2		EPI 202 EPI 290 STA 144* Elective(s)	EPI 203 EPI 290 PHR 266* Elective(s)	EPI 204 EPI 290 Elective(s)
Year 3	Pre-qualifying Examination	EPI 208 Elective(s)	Qualifying Examination	Dissertation Research
Years 4-6	Dissertation Research	Dissertation Research	Dissertation Research	Exit/Defense Seminar(s)

For students who have completed prerequisites (sample):

	Summer	Fall	Winter	Spring
Year 1		EPI 202 EPI 205 EPI 290 Elective(s)	EPI 203 EPI 206 EPI 290 PHR 202* Elective(s)	EPI 204 EPI 207 EPI 290
Year 2	Pre-qualifying Examination	EPI 290 STA 144* Elective(s)	EPI 290 Qualifying Examination	Dissertation Research
Years 3-5	Dissertation Research	Dissertation Research	Dissertation Research	Exit/Defense Seminar(s)

*Either PHR 202 or STA 144 must be taken.

Examinations

MS Comprehensive Examination (Plan II): The comprehensive examination is the last requirement for Plan II and is taken when the student has been advanced to candidacy, usually during the fourth to sixth quarter of enrollment. It is both written and oral and designed to assess the student's mastery and working knowledge of subjects presented in the required courses. Details are described in the degree requirements which are posted on the [GGE website](#). MS students may choose to follow Plan I, writing of a thesis to satisfy the MS degree (see below).

PhD Prequalifying Written Examination: The prequalifying written exam is design to assess the student's mastery and working knowledge of subjects presented in the required courses as well as his/her ability to evaluate methods, analyze and logically interpret data. The examination consists of three sections: basic epidemiology, advanced epidemiology, and statistics, and usually takes place in early- to mid-September. For more details, see Section C below.

PhD Qualifying Oral Examination: Students must pass the prequalifying written exam before taking the oral qualifying exam (QE). Passing the QE makes the student eligible for advancement to candidacy and is ordinarily taken by the ninth quarter of the student's enrollment. The purpose of the examination is to assess whether the student is capable of critical and independent thinking related to epidemiology, statistics, her/his Area of Interest, and selected topic and to assess whether the student is qualified to proceed with her/his dissertation research. For details, see Section F below.

Thesis/Dissertation Research

MS Thesis (Plan I): The thesis must be an original contribution to knowledge and demonstrate creative and independent work. The topic must be approved by a student's guidance committee, usually by the third quarter of the student's enrollment. If course prerequisites are met, the thesis should ordinarily be completed by the fourth to sixth quarter. All aspects of the thesis must be defensible and demonstrate the student's knowledge of relevant literature and research methods. For further detail, see the Degree Requirements.

PhD Dissertation: The dissertation must be an original contribution to knowledge in epidemiology and demonstrate creative and independent work that is publishable in a peer-reviewed journal. All aspects of the dissertation must be defensible including hypotheses, data quality, methods, results and interpretation. The format of the dissertation typically will include an introduction, critical review of the literature, at least three chapters, each representing a publishable paper in a journal-ready format, and a summary. The dissertation involves a required exit seminar and an optional defense seminar (see Section G).

International Students

Please refer to the [Graduate Studies website](#) for all questions related to international student status, passport, visas, etc. Also, the GGE has historically enrolled a plethora of international students from a diverse number of countries. In addition, the Office of [Services for International Students & Scholars](#) assists international students in their pre-arrival preparation and provides immigration advice, financial information, general advising and counseling, and a variety of cross-cultural activities.

For international students, a solid foundation in reading, speaking, and writing English is strongly advised, since this is required for coursework as well as for the completion of theses and dissertations. This campus offers a number of resources to assist foreign students in perfecting their English speaking and writing skills. If you need additional help in English, be sure to discuss this with your graduate advisor so that you can include an appropriate English course in your schedule.

Additional Resources

Please see Section M at the end of this handbook for further academic resources, and the Graduate Student Survival Guide for non-academic resources.

B. Annual Evaluation of Progress

Graduate Council policy requires the graduate advisor to file an annual, written evaluation of the academic progress of each graduate student. This procedure is intended to ensure that *each student receives from the faculty (major professor or guidance committee chair) a careful, written assessment of her/his progress at least once during every academic year.*

On the basis of this evaluation, each student who is rated as making unsatisfactory progress receives a warning letter from Graduate Studies indicating specific conditions that must be met in order to continue in graduate status. A satisfactory progress report does not necessarily imply that a student will ultimately succeed in completing a graduate program. These reports do, however, serve to provide the student and Graduate Studies with a more accurate assessment of performance than might otherwise be available.

The median time to degree depends on whether students have a prior related degree, such as a master's degree in statistics or an MPVM degree, because the time to complete coursework differs for these two groups. The median times to degree for MS students are 2-3 years and for PhD students are approximately 4 years (with prior degree) and 6 years otherwise.

MS Residency: Candidates for the MS degree must be in residence at least three academic quarters. Two consecutive six-week summer sessions may be counted as the equivalent of one regular quarter. A minimum of two units must be taken in each session.

MS Scholarship: Only courses in the 100, 200, 300 or 400 series in which the student receives grades of A, B, C and S may be counted in satisfaction of the requirements for the master's degree. A course in which a student receives a D+ or lower cannot be used to satisfy the unit requirement for the master's degree but will count in determining the grade point average. Courses in the 300 or 400 series may be accepted as 200 series courses if they have been approved by Graduate Council as graduate-level courses. Students must maintain a GPA of 3.0 or better in all upper division and graduate courses elected during their residence as graduate students.

For PhD students in the GGE, satisfactory progress consists of:

Residency: Students working toward a doctorate must be registered and in university (Graduate Studies) residence for a minimum of 6 quarters. Two consecutive six-week summer sessions may be counted as the equivalent of one regular quarter if at least 2 units are taken in each.

Scholarship: Students must have completed all required coursework and have achieved a GPA of 3.3 or better in all graduate work.

Qualifying Examination (QE): Students should successfully complete the qualifying examination and file for advancement to candidacy within 2 quarters of becoming eligible to take the examination, within 2 years of entering the program for students with a prior related degree and within 3 years of entering the program for students without a prior related degree.

Time to Completion: Students should complete all degree requirements, including the exit seminar on the dissertation and filing of the dissertation, within 3 years of advancing to candidacy and within 5 or 6 years of entering the PhD program, depending on prior degree

status. Students who exceed either of the above requirements by less than one year at the annual evaluation of progress (June 30) will be given a “marginal” evaluation, and students who exceed either requirement by more than one year will be given an “unsatisfactory” evaluation. Appeals for exceptions to this policy may be made to the committee of graduate advisors.

C. PhD Prequalifying Written Examination Information

After completion of coursework and equivalents (except EPI 208), and before the qualifying examination, *students must pass a prequalifying written examination*. The purposes of the written examination are to determine whether a PhD student has mastered the fundamental knowledge needed to pursue research in epidemiology and to allow project-specific assessment of students during the qualifying examination by reducing time spent examining the student on material covered in didactic instruction.

Material Covered

The areas covered in the written examination are listed in the written exam study topics section (Section E), the majority of which are presented in the required core courses in basic epidemiology, epidemiologic study design, advanced epidemiology, and statistics. This topic list may be reviewed periodically, but not in the period 90 days before the examination.

Nature of the examination

Exam questions will test the student's knowledge of epidemiologic and statistical methods and of their theoretical bases and the student's ability to evaluate methodology, analyze data, and demonstrate logical interpretation of data. Question types will be essay, problem solving, and derivations. The examination will be an integrated exam in two parts: 1) basic epidemiologic tools, epidemiologic study design, and basic statistics; and 2) advanced epidemiology and statistics. It is expected that questions relating to epidemiology will constitute the majority of the total examination.

Timing of the examination

The annual examination will be held in two sessions (1 session per day, usually on 2 consecutive days) in September, before fall quarter begins. Typically, each session will be designed to take a knowledgeable student approximately three hours to complete, with the examination being scheduled for four hours. Students who do not pass one or both parts in their first attempt must retake the part(s) of the exam they did not pass. Students must be available to take the exam when offered or wait for to take it when offered the next year.

Examination outcome

The passing score for the examination will be determined by the examination committee and communicated to the students prior to each offering of the examination. Typically, scores will be provided to the students within 4 weeks of the examination.

Retake Examination

Typically, the retake examination will be scheduled for 2-3 months after the regular examination. At the discretion of the written examination committee, a retake examination for those students that did not pass one or more sections of a scheduled exam may be scheduled outside of the normal examination schedule.

A student who receives a "fail" on a retake examination will be recommended for disqualification from the PhD program. The graduate advisor will file an unsatisfactory progress report with Graduate Studies, and send the student a letter informing her/him of the lack of satisfactory progress (with a copy to Graduate Studies). Students have the right to appeal the recommendation for disqualification to the dean of Graduate Studies, in accordance with the UC Davis Graduate Studies Policy on Disqualification and Appeal (GS 2005-01), and to petition the

graduate advisors committee for transfer to the MS program (as described elsewhere in these guidelines).

D. Areas of Interest – Approved Elective Courses

The area of interest minimum requirements for students in the Graduate Group in Epidemiology are as follows:

- MS Plan 1 (thesis option): 9 units in an Area of Interest
- MS Plan 2 (exam option): 12 units of electives, which include 9 units in one Area of Interest
- PhD: 12 units of electives, which include 9 units in one Area of Interest

We allow students to apply up to 3 units of **methodologically-oriented courses from the Epidemiologic Methods and Biostatistics Area of Interest** towards the minimum 9 units Area of Interest requirement, so a minimum of 6 units in **Area of Interest subject-matter courses** are required. Courses at UC Davis are sometimes dropped, and new courses are added, so if you believe an unlisted course should be added (or a listed one removed because it is no longer offered) please bring this to the attention of your graduate advisor. Students may form their own Area of Interest in collaboration with their advisor and major professor, or by revising a current area listed below.

“Group Study” courses that are numbered 298 cannot, in general, be applied toward elective unit requirements. However, an exception can be made by a graduate advisor if the course’s instructor of record has submitted the course to the campus for formal graduate course-level approval in the numbered 200 series. If the Graduate Group in Epidemiology’s Educational Policy Committee approves the course, then an exception can be granted by a student’s graduate advisor prior to formal course approval by the UC Davis Committee on Courses and Instruction. The Areas of Interest are:

1. Epidemiologic Methods and Biostatistics
2. Health Services and Health Economics
3. Infectious Disease Epidemiology
4. Nutritional Epidemiology
5. Occupational and Environmental Epidemiology
6. Reproductive, Perinatal, Developmental and Pediatric Epidemiology
7. Social and Behavioral Epidemiology
8. Wildlife Epidemiology
9. Zoonotic and Vectorborne Disease Epidemiology

***Course offerings are subject to change without notice**

1. Epidemiologic Methods and Biostatistics

BST/STA 225	Clinical trials (4)	SPRING
EPI 209	History of Epidemiology in Public Health (2) (proposed)	Variable*
EPI 223	Spatial epidemiology (3)	SPRING Alt year
EPI 224	Human and ecologic risk analysis (3)	WINTER Alt year
EPI 225	Advanced topics in epidemiologic methodology (2)	SPRING
EPI 226	Methods for Longitudinal and Repeated Measurement Data	SPRING
EPI 230	Introduction to molecular epidemiology (3)	SPRING Alt year
MHI 209	Clinical Data Acquisition and Analysis (4)	FALL
MHI 210	Introduction to Health Informatics (4)	FALL
MHI 289F	Database and Knowledge Management (4)	WINTER
PHR 203	Multivariate Biostatistics (3)	WINTER
PHR/SPH 266	Applied analytic epidemiology (3)	SPRING
STA 135	Multivariate data analysis (4)	SPRING
STA 137	Applied time series analysis (4)	SPRING
STA 138	Analysis of categorical data (4)	FALL
STA 141A	Fundamentals of Statistical Data Science (4)	FALL
STA141B	Data & Web Technologies for Data Analysis (4)	WINTER
STA141C	Big Data & High Performance Statistical Computing (4)	SPRING
STA 145	Bayesian statistical inference (4)	WINTER
STA 205	Statistical methods for research in SAS (4)	SPRING
PHR/EPI 277	Mathematical models in epidemiology (3)	SPRING
VME 217	Evaluation and application of diagnostic tests (2)	SPRING Alt year

*Check with department. Courses offered on a variable schedule- priority registration given to students within that major.

2. Health Services and Health Economics

Area-specific courses (minimum 6 units; 400-series courses require special approval; ECN 100 and ARE 100A may not count toward the unit requirement):

ARE 100A	Intermediate microeconomics: Theory of production and consumption (4)	F/W/S
ARE 100B	Intermediate microeconomics: Imperfect competition, markets, and welfare economics (4)	F/W/S
ARE 130	Agricultural markets (4)	WINTER
ARE 147	Resource and environmental policy analysis (3)	WINTER
ARE 176	Environmental economics (4)	WINTER
ARE/ECN 204	Microeconomic analysis (5)	FALL
ARE/ECN 215A	Microdevelopment theory and methods I (4)	FALL
ARE/ECN 215C	Microdevelopment theory and methods II (4)	SPRING
ARE/ECN 240A	Econometric methods (4)	WINTER
ARE/ECN 240B	Econometric methods (4)	WINTER
ARE 252	Applied linear programming (4)	WINTER
CLH 210	Principles and Methods of Comparative Effectiveness Research (4)	SPRING
ECN 100	Intermediate micro theory (4)	F/W/S
ECN 102	Analysis of economic data (4)	F/W/S
ECN 103	Economics of uncertainty and information (4)	FALL
ECN 132	Health economics (4)	WINTER
ECN 140	Econometrics (4)	WINTER
ECN 151A	Economics of the labor market (4)	F/S
ECN 151B	Economics of human resources (4)	W/S
ECN 250A	Labor economics (4)	FALL
ECN 250B	Labor economics (4)	WINTER
EPI 291	Seminars in human health services research and clinical epidemiology (1 unit maximum)	F/W/S
SPH 246	Biostatistics for Clinical Research (4)	WINTER
SPH 273	Health services administration (3)	WINTER
SPH 274	Economic Evaluation in Health Care (proposed)	SPRING

3. Infectious Disease Epidemiology

Area-specific courses (minimum 6 units; 400-series courses require special approval; ECL220 cannot be applied toward unit requirement):

ABT 182	Environmental analysis using GIS (4)	SPRING
ECL 220	Spatio-temporal ecology (2)	SPRING
ENT 153	Medical entomology (4)	WINTER
ENT 156	Biology of parasitism (3)	SPRING
ENT 253	Advanced medical entomology (3)	SPRING
EVE 100	Introduction to evolution (4)	F/W/S
EVE 101	Introduction to ecology (4)	F/W/S
SPH 211	Infectious disease and global health (3)	WINTER
EPI 230	Introduction to molecular epidemiology (3)	SPRING Alt yr
EPI 231	Infectious disease epidemiology (3)	Not offered 2016/2017
EPI/PHR 277	Mathematical models in epidemiology (3)	SPRING
MIC 162	General virology (4)	WINTER
MIC 215	Recombinant DNA (2)	FALL
MMI 115	Ecological parasitology (3)	WINTER
MMI 200D	Mechanisms of microbial interactions with hosts (3)	WINTER
MMI 215	Medical parasitology (5)	SPRING
MMI 280	Molecular pathobiology for diagnosis and therapy of human and animal diseases (3)	SPRING
PHR 212	Epidemiology of the zoonoses (3)	WINTER
PMI 126	Fundamentals of immunology (3)	WINTER
PMI 126L	Immunology laboratory (2)	WINTER
PMI 128	Biology of animal viruses (3)	SPRING
PMI 270	Advanced immunology (3)	WINTER
VME 158/258	Infectious Disease in Ecology and Conservation (3/1)	WINTER
MPM 201	Emerging Issues at Interface of Animal, Human and Ecosystem Health (3)	WINTER

4. Nutritional epidemiology

Area-specific courses (minimum 6 units; NUT 111-112 may not count toward the unit requirement):

NUT 11A	Introduction to nutrition and metabolism (3)	WINTER
NUT 11B	Recommendations and standards for human nutrition (2)	SPRING
NUT 112	Nutritional assess: Dietary, anthropometric, & clinical measures (3)	SPRING
FST 211	Lipids: chemistry and nutrition (3)	WINTER
NUT 202	Advanced nutritional energetics (2)	SPRING
NUT 219A/B	International nutrition (3-6)	WINTER
NUT 252	Nutrition and development (3)	WINTER
NUT 258	Field research methods in international nutrition (3)	WINTER

5. Occupational and Environmental Epidemiology

Area-specific courses (minimum 6 units):

ECI 149	Introduction to air pollution (3)	FALL
EPI 240	Principles of injury epidemiology (3)	WINTER
EPI 251	Environmental epidemiology (3)	WINTER
EPI 260	Epidemiology of chronic diseases and aging (3)	WINTER
EPI 272	Cancer epidemiology (2)	WINTER
SPH 222	Social and behavioral aspects of public health (3)	FALL*
SPH 255	Human reproductive epidemiology (3)	Not currently offered
SPH 262	Principles of environmental health sciences (3)	SUMMER
ETX 101	Principles of environmental toxicology (3)	FALL
ETX 102A	Environmental fate of toxicants (4)	WINTER
ETX 102B	Quantitative analysis of environmental toxicants (5)	SPRING
ETX 103A	Biological effects of toxicants (4)	WINTER
ETX 103B	Biological effects of toxicants: Experimental approaches (5)	SPRING
ETX 214	Mechanisms of toxic action (3)	SPRING
ETX 128	Food toxicology (3)	SPRING
ETX 131	Environmental toxicology of air pollutants (3)	FALL
ETX 135	Health risk assessment of toxicants (3)	FALL
ETX 138	Legal aspects of environmental toxicology (3)	WINTER
ETX 146	Exposure and dose assessment (3)	SPRING
ETX 203	Environmental toxicants (4)	WINTER
ETX 270	Toxicology of pesticides (3)	Alt year
NPB 121/L	Physiology of reproduction laboratory (1)	WINTER
PTX 201	Principles of pharmacology and toxicology I (5)	FALL
PTX 202	Principles of pharmacology and toxicology II (4)	WINTER
PTX 203	Principles of pharmacology and toxicology III (4)	SPRING
PTX 230	Advanced topics in pharmacology and toxicology (1-3)	F/W/S

*As space allows

6. Reproductive, Perinatal, Developmental and Pediatric Epidemiology

Area-specific courses (minimum 6 units; ECN 100 and ARE 100A may not count toward the unit requirement):

ANS 123	Animal Growth and Development	SPRING
ANS 124	Lactation	WINTER
ANS 131	Reproduction and Early Development in Aquatic Animals	SPRING
AVS 103	Avian Development and Genetics	FALL
AVS 121	Avian Reproduction	WINTER
EDU 210	Psychology of School Learning (4)	SPRING
EPI230	Introduction to molecular epidemiology (3)	SPRING Alt year
EPI 240	Principles of Injury Epidemiology (3)	WINTER
EPI 251	Environmental Epidemiology (3)	WINTER
SPH 255	Human Reproductive Epidemiology (3)	Not currently offered
ETX 250	Reproductive Toxicology (3)	WINTER
HDE 200A	Early Development (4)	FALL
HDE 200B	Middle Childhood and Adolescence (4)	WINTER
HDE 220	Research Methods in Human Growth and Development (4)	SPRING
HDE 231	Issues in Cognitive and Linguistic Development (3)	Variable*
MCB 251	Molecular Mechanisms in Early Development (3)	FALL
MCB 222	Mammalian Gametogenesis and Fertilization (3)	SPRING
MCB 255	Molecular Mechanisms in Pattern Form and Development (3)	SPRING
NPB 121/L	Physiology of Reproduction Laboratory (1)	WINTER
NPB 122	Developmental Endocrinology (3)	FALL
NUT 219A/B	International Nutrition (3-6)	A-F, B-S
NUT 252	Nutrition and Development (3)	WINTER
NUT 260	Nutrition During Pregnancy (6)	FALL
NUT 261	Lactation and Infant Nutrition (6)	WINTER
NUT 262	Child and Adolescent Nutrition (6)	SPRING
PSY 212A	Developmental Psychology: Cognitive and Perceptual Development (4)	FALL
PSY 212B	Developmental Psychology: Social, Emotional and Personality Development (4)	WINTER
PSY 261	Cognitive Neuroscience (4)	SPRING

*Check with department. Courses offered on a variable schedule- priority registration given to students within that major.

7. Social and Behavioral Epidemiology

Area-specific courses (minimum 6 units):

CMN 222	Risk Communication (4)	Variable*
CMN 232	Health Communication (4)	WINTER
CMN 243	Media and Health (4)	WINTER
CRD 172	Social Inequality: Issues and Innovations (4)	SPRING
CRD 240	Community Development Theory (4)	FALL
CRD 247	Transformation of Work (4)	SPRING
EPI 231	Infectious Disease Epidemiology (3)	NA 2016/17
EPI 240	Principles of Injury Epidemiology (3)	WINTER
EPI 252	Social Epidemiology (2)	SPRING
EPI 260	Epidemiology of Chronic Diseases and Aging (3)	WINTER
HDE 210	Theories of Behavioral Development (3)	
PSY 126	Health Psychology (4)	W/S
PSY 217	Behavioral Genetics (4)	WINTER
SOC 254	Sociological Issues in Health Care (4)	Not currently offered
SPH 222	Social and Behavioral Aspects of Public Health (3)	FALL**

*Check with department. Courses offered on a variable schedule- priority registration given to students within that major.

**As space allows

8. Wildlife Epidemiology

Area-specific courses (minimum 6 units; EVE 100-101 may not count toward the unit requirement):

ECL 200A	Principles and applications of ecology (4)	FALL
ECL 200B	Principles and applications of ecology (4)	WINTER
ECL 204	Population and community ecology (4)	FALL
ECL 205	Community ecology (4)	WINTER
ECL 208	Issues in conservation biology (4)	WINTER
ECL 212A	Environmental policy process (4)	FALL
ECL 212B	Environmental policy evaluation (4)	SPRING
ECL 232	Theoretical ecology (3)	WINTER
ENT 153	Medical entomology (4)	WINTER
ENT 225	Terrestrial field ecology (4)	SPRING
ENT 253	Advanced medical entomology (3)	SPRING
EVE 100	Introduction to evolution (4)	F/W/S
EVE 101	Introduction to ecology (4)	F/W/S
MPM 201	Emerging issues at the interface of ecosystem, animal and human health (3)	WINTER
WFC 122	Populations dynamics and estimation (4)	SPRING
WFC 151	Wildlife ecology (3)	FALL
WFC 153	Wildlife ecotoxicology (4)	Variable*
WFC 222	Advanced population dynamics (3)	WINTER

*Check with department. Courses offered on a variable schedule-priority registration given to students within that major.

9. Zoonotic and Vectorborne diseases

Area-specific courses (minimum 6 units; 400-series courses require special approval; EVE 100-101 may not count toward the unit requirement):

ENT 153	Medical entomology (4)	WINTER
ENG 253	Advanced medical entomology (3)	SPRING
ENT 156	Biology of parasitism (3)	SPRING
PHR 212	Epidemiology of the zoonoses (4)	WINTER
PHR 220	Zoonoses of non-human primates (4)	WINTER
PMI 214	Vector-borne infectious diseases: changing patterns (2)	FALL
VME 217	Evaluation and application of diagnostic tests (2)	SPRING

E. Study Topics for PhD Prequalifying Written Examination

Updated April 26, 2016

This topic list is meant as a guide for studying and mastering key concepts in epidemiology and biostatistics but is not all-inclusive, so please use your judgement and discuss with the faculty any additional topics that may be relevant or core to the GGE.

Basic Epidemiology and Epidemiologic Study Design (EPI 205 & EPI 206)

Causation

- Necessary, Sufficient
- Koch-Henle Criteria
- Bradford Hill Criteria

Measures of Accuracy

- Precision
- Validity

Bias and types of Bias

- Selection
- Information/misclassification (differential/non-differential)
- Confounding

Random Error/Variability

Measures of Disease

- Frequency
- Prevalence
- Incidence (understand subject-time)
- Risk/probability
- Rate
- Ratio
- Incidence/disease odds (versus exposure odds)
- Crude and conditional measures

Statistical Measures of Disease Association and Causal Effect Parameters

- Risk Ratio (“relative risk”)
- Incidence Rate Ratio
- Odds Ratio (including matched-pairs odds ratio, and the “rare disease assumption”)
- Attributable Risk
- Etiologic Fraction
- Population Attributable Risk

Confounding

- Methods for identifying/detecting confounding
- Methods for controlling confounding

Interaction (effect measure modification)

- Additive
- Multiplicative
- Absolute vs. Relative Measures of Effect

Standardized Rates

- Directly standardized rates
- Indirectly standardized rates / Standardized mortality (and morbidity) ratios

Outbreak investigation

Diagnostic test evaluation and screening tests

Updated October 12, 2016

- Sensitivity and specificity
- Likelihood ratios (binary, ordinal and quantitative tests)
- Comparison of sensitivity and specificity of 2 tests
- Predictive value positive and predictive value negative
- Prevalence/apparent prevalence relationship
- Sensitivity, specificity and predictive values of tests in series and parallel
- Kappa for inter-observer agreement
- ROC curves

Study Design

Types of Studies

Experimental

- Clinical Trials

- Field Trials

Observational

- Cross-sectional Studies

- Cohort Studies (retrospective and prospective)

- Case-control Studies (including “nested”)

- Matched Case-control studies

- Ecological studies

Know advantages and disadvantages of each study type

Know biases of each study type

Know measures of association in each study type

Know how to analyze each study type

Know how to conduct sampling and select subjects for each study type

Advanced Epidemiologic Methods (EPI 207)

Everything listed under basic epidemiology and epidemiologic study design PLUS:

Directed acyclic graphs (DAGs)

- Understanding and distinguishing confounders, colliders, and intermediates

- Direct, indirect and total effects

- Conditional and marginal independence/association

Study Design:

Experimental Studies

- Randomization

- Blinding

- Intention-to-treat analysis

Observational Studies

- Ecologic

- Case-control Studies - Methods of Control Selection

- Case-cohort sampling

- Cumulative incidence sampling

- Nested case-control / incidence density sampling

- Case-crossover Studies

Proportionate Mortality Ratios and Mortality Odds Ratios

Potential outcomes model

- Identifiability/Non-identifiability

- Including doomed, immune, protective, causal

- Comparability

Collapsibility/Simpson's Paradox

Updated October 12, 2016

Causation/Causal Inference

- Selection of comparison groups
- Study base principles

Bias

- Conditions for selection bias
- Effects of confounding

Equate Disease OR to Exposure OR

- Be able to derive one from the other, provide appropriate interpretations

Concepts of Interaction

- Trend
- Homogeneity/heterogeneity on additive and multiplicative scales

Basic Biostatistics (EPI 202)

Probability

- Definition and properties
- Exponential and logarithm functions
- Conditional probability
- Law of total probability
- Bayes Theorem
- Applications to epidemiology: sensitivity, specificity, predictive value +/-, prevalence

Random variables (RVs) and their distributions

- Discrete distribution models
- Continuous distribution models
- Applications to epidemiology: when are specific distributions appropriate
- Marginal, conditional and joint distributions
- Properties of RVs
- Expectation and conditional expectation
- Correlation and covariance
- Variance and covariance of linear combination of RVs
- Cumulative distribution function
- Transformation methods
- Applications and interpretations of all techniques in epidemiology

Large sample properties

- Limiting distributions
- Convergence in probability
- Law of large numbers
- Central limit theorem
- Asymptotic normal distribution
- Standardization

Basic Statistical Inference (EPI 203 and Prerequisites)

Parametric Tests

- z-statistic
- t-statistic
- ANOVA
- Linear regression

Non-parametric Tests

- Mann-Whitney
- Wilcoxon Rank

- Kruskal-Wallis
- Friedman
- Chi-square statistic
 - Chi-square 2 x 2 contingency table
 - McNemar's test
- Types of Data (continuous, dichotomous, etc.)
- Hypothesis testing
 - P-value and type I error
 - Confidence intervals
 - Power and type II error
 - Sample size calculations

Advanced Biostatistics

EPI 203

- Sampling distributions
 - Meaning
 - Examples
 - Large sample approximation
- Point Estimation
 - Criteria for evaluating estimators--e.g. bias, variance, mean square error (MSE)
 - Large sample properties
 - Minimum variance
 - Cramer-Rao Lower Bound
 - Fisher Information (variance covariance matrix)
 - Maximum likelihood (ML) estimation
 - Likelihood
 - Properties of ML estimators
 - Method of moments estimators
- Confidence interval (CI) estimation
 - Methods for CI construction
 - Interpretation of confidence intervals
- Hypothesis testing
 - Hypothesis testing framework
 - Criteria for evaluating tests
 - Neyman Pearson Lemma and Best Critical Region
 - Level/size of tests
 - Power of tests
 - Likelihood Ratio Test
 - (Generalized) likelihood ratio test

EPI 204

- Know all assumptions for all general linear statistical models
- Modeling binary outcomes: Logistic regression for binary outcome data in prospective and retrospective studies; models for matched and unmatched data; logits/log odds, Mantel-Haenszel weighted odds ratio
 - Model and model interpretation
 - Assumptions and limitations
 - Estimation of model parameters
 - Model-based inference (CI, hypothesis testing)

- Model-building
- Interaction and confounding
- Modeling categorical and ordinal outcome: multinomial logistic, proportional odds model
 - Model and model interpretation
 - Assumptions and limitations
 - Estimation of model parameters
 - Model-based inference (CI, hypothesis testing)
- Model-building
- Interaction and confounding
- Modeling time to failure (censored) data (survival analysis): life tables, Kaplan-Meier, log-rank tests; Cox proportional hazards (PH) model
 - Model and model interpretation
 - Assumptions and limitations
 - Estimation of model parameters
 - Model-based inference (CI, hypothesis testing)
- Model-building
- Interaction and confounding

F. PhD Qualifying Examination Information

GGE PhD students must pass the prequalifying written examination before taking the oral qualifying examination. Students in a PhD program at the University of California are required by the university to pass the qualifying examination (QE) before being advanced to candidacy for the degree. The qualifying examination committee evaluation will consider relevant portions of the student's academic record and performance on the examination in making an overall evaluation of the student's performance and potential for scholarly research.

The purpose of the QE in the GGE is to assess whether the student is prepared for and capable of independent and critical thinking in general, and especially in the broad areas of epidemiology, statistics, the area of interest, and in the specialized topic selected by the student, and to assess whether the student is qualified to pursue the formal research phase of the PhD program.

The QE differs from the GGE prequalifying written examination in that the QE evaluates the student's ability to integrate and utilize the knowledge and skills critical for independent and creative research and analysis. The prequalifying examination emphasizes the assessment of mastery, working knowledge, and understanding of the materials presented in the required core courses of the GGE program; whereas the QE focuses on the student's ability to synthesize ideas and concepts, formulate approaches, problem-solve, and demonstrate the breadth and depth of knowledge at an advanced level of understanding of the theory and concepts in areas being examined. QE assessment often is made partly in the context of the student's proposed research, whereas assessment in the prequalifying examination does not.

Timing of the Examination

If minimal or no required coursework has been undertaken prior to admission, the QE should be taken between spring quarter of the second year and the end of spring quarter of the third year. If significant coursework (e.g., MPVM coursework) has been taken prior to admission, however, the student is expected to take the QE before fall quarter of the third year. Failure to meet these milestones may be considered unsatisfactory progress.

Once each quarter, the graduate advisors will nominate qualifying committees for those students who will become eligible to take the QE by the end of that quarter. The date of the examination will be determined by the student and the committee chair. It is the responsibility of the student to arrange the date and time of the examination with all committee members. The examination should be scheduled at least 3 months from the time committee nominations are submitted to Graduate Studies. Note that some faculty are on 9-month appointments and may not be available during the summer.

Eligibility

To be eligible for the QE, the student must have satisfied all GGE course requirements, removed any deficiencies, and have at least a 'B +' (3.3 GPA) average for all upper division and 200-series courses taken while registered as a graduate student. The student must be registered for the quarter in which any portion of the examination is taken. In order to take the QE over the summer, the student must be registered during spring quarter.

Selection of the Committee

A QE committee ordinarily consists of five members. The student should meet with the graduate advisor at least three months prior to the proposed date of the examination to discuss the

examination. The student is to notify the graduate advisor of the field of the specialized topic, which s/he will defend. The specialized topic is a topic more directly related to the dissertation topic. For example, if the Area of Interest is infectious disease epidemiology, the specialized topic can be the specific disease under study in the dissertation.

If a student wishes, s/he may submit names of faculty s/he considers qualified to examine the student in the fields of the Area of Interest and specialized topic. During the quarter in which all course requirements will have been met, the graduate advisor will submit to the student an initial list of faculty for the committee. There should be no expectation that any of those listed by the student necessarily will be nominated. One member may be appointed from outside the Group though not required. See the Advisor's Handbook for further details.

After consulting with the student, the advisor will submit nominations to Graduate Studies. Any member who serves on the qualifying committee is ineligible to serve later as chair of the dissertation committee. Note that QE committee member nominations are submitted to the Office of Graduate Studies for formal appointment in accordance with Graduate Council policy (DDB 80, Graduate Council, B.1.) See the [Graduate Council policy on doctoral qualifying examinations](#) for further details on the QE process.

Requirements for membership on QE committees have been established by the Graduate Council in an effort to ensure that the examination is a fair and accurate measure of the student's ability and progress. A member of a committee must have earned a doctorate and must have demonstrated creative and independent research and distinguished accomplishment in the field being examined. Under some circumstances, one member of the committee, who is not a faculty member of the University of California, may be appointed on the basis of special expertise and qualifications. The graduate advisor must submit to Graduate Studies a brief statement indicating the potential appointee's affiliation and title and degrees held, and describing the special expertise that is not otherwise available. A curriculum vitae and a letter from the nominated person indicating willingness to serve also should be submitted.

If a student is dissatisfied with a nomination, the student should submit an appeal to the executive committee of the GGE via the chair of the GGE. If the student is dissatisfied with the decision of the executive committee, the student may submit an appeal to the associate dean of Graduate Studies.

Student Responsibilities

Prior to nomination of the QE committee, the student should provide the graduate advisor with a one-page abstract or summary of the student's proposed research, including the hypothesis and methods to assist the graduate advisor in identifying appropriate faculty to serve on the QE.

The student should meet with each nominated QE committee member at least twice before the scheduled examination. Frequency, duration, and number of meetings between an individual committee members and the student are decided by those two individuals. The purposes of the meetings should be to understand the committee member's expectations for the student's performance on the QE, to identify relevant material and approaches for preparation, and to familiarize the faculty with the student's proposed research.

Students may enroll in an EPI 299 course with each faculty member, if warranted by the body of subject material and agreed upon by the committee member. Students should notify their

graduate advisor if a committee member could not accommodate a request to meet at least twice before the scheduled examination. The student must contact each member of the QE committee to determine dates and times available for the QE, and must notify each QE committee member of the final date, time, and location of the QE.

The student must reserve a room for the QE for at least 4 hours for the date and time; the typical time for the examination process is at least 3 hours. The GGE administrative support person can help the student identify available rooms.

In coordination with the chair of the QE committee, the student must provide each QE committee member with a written project proposal at least one week before the scheduled examination. General recommendations for the written proposal are provided in Appendix A of this guidebook, but the student should consult with the chair of the QE committee to determine any specific expectations the committee members may have for format, detail, and length of the proposal.

Research Proposal Seminar

The student is required to present a seminar describing the proposed dissertation research topic. The seminar should indicate the specific hypotheses, the reasoning behind the hypotheses, design, materials, assays, methods, statistical tests and anticipated results. The seminar must be presented prior to the QE. The student is responsible for scheduling, in conjunction with the QE committee members, the required GGE seminar on her/his proposed research sometime before the QE; the seminar must be attended by all QE members, and must be advertised at least two weeks prior to the seminar by e-mail to the entire GGE.

Format and Administration of the Examination

The general guidelines for administration of the QE, including responsibility of the QE committee chair, options for passing, not passing, or failing, and advancement to candidacy are available from Graduate Studies, UC Davis, Mrak Hall.

Shortly after the QE committee receives notification of its nomination, the QE committee chair, in consultation with the graduate advisor and the QE committee, should determine if the examination should proceed, as judged by a review of the student's transcripts, to verify that all requirements have been met, to assess performance in required core and elective courses and in the research proposal seminar, and to assess preparation for her/his Area of Interest and specialized topic. Copies of the student's transcripts and of the approved course plan, which indicates all the courses taken to fulfill the Area of Interest and specialized topic, will be provided at the time of notification of nomination by the graduate advisor. Although the guidance committee, major professor, graduate advisor, and committee of graduate advisors all are responsible for assessing whether the student is prepared to take the QE, the QE committee assumes the final responsibility in determining whether the examination should proceed. The committee, or a committee member communicating through the chair, however, may determine at any time before the scheduled QE that the student is not prepared to take the QE and that the QE should not proceed as scheduled.

If it is determined that the QE should not proceed, the chair is responsible for communicating in writing to the student, with a copy to the graduate advisor, why the committee believes the QE should not proceed and what student deficiencies must be met in a specified time frame before the QE can be rescheduled. The rescheduled QE should take place in the most expedient and

specified time frame based on student deficiencies that need to be fulfilled, preferable within six months of the first scheduled QE.

If it is determined that the QE should proceed, the QE committee will determine, by majority vote, the specific format of the exam. The format should consider whether, in addition to the oral component, the examination will include a written component from one or more committee members, the specific format for any written component, whether or not the student should present an overview of the proposed research, the duration of any such presentation, the format for oral questioning, and scheduled breaks in the examination. Students should be given at least 2 months to complete any written component of the QE, which should be handed back to the QE committee at least 2 weeks before the scheduled date of the QE. Written questions may also be given for retake of certain portions of the exam on which the student's performance was not adequate (any written component is considered part of this administration of the QE). While students are encouraged to use library resources, the student may not discuss written questions with individuals other than members of their QE committee. The QE committee is responsible for ensuring that the anticipated effort to be put forth by the student in completing the examination is fair and reasonable.

The content of examination questions or material used by an individual committee member to assess student abilities is determined by the individual member; academic freedom dictates that the content of questions or examination material of individual faculty members is not subject to debate by the QE committee. All members of the QE committee must meet formally as a group with the student to administer the QE, to clarify any written responses to questions administered prior to the scheduled QE, and to assess the student's overall performance on the examination. All committee members are required to attend (as required by the Academic Senate), and should actively participate, during the entire scheduled QE of the student. The QE should not be allowed to proceed if all members will not or cannot be present during the entire scheduled examination.

Examination

In preparing for the qualifying examination, the following significance and expectation of the PhD degree should be borne in mind by the student and qualifying committee: "The recipient of the PhD degree is understood to possess thorough knowledge of a broad field of learning and to have given evidence of creative and distinguished accomplishment in that field; the degree is a warrant of critical ability and powers of imaginative synthesis."

The dissertation proposal is to be prepared by the student and distributed to the committee at least two weeks prior to the examination. The proposal is to be written in the format found in **Appendix A** and should not exceed 10 typed single-spaced pages. The proposal will be considered in evaluating the student's potential for scholarly research. The student also is to provide the chair of the QE committee with a curriculum vitae.

In addition to the areas of epidemiology, research, and quantitative methods, the student will be examined in their approved Area of Interest and a specialized topic selected by the student within the broad scope of epidemiology. Informal "mock" examinations with a group of faculty and/or students are encouraged.

Assessment of Student Performance by the Committee

A committee member should refrain from making conclusions as to the ultimate disposition of the QE until the final phase of the process when the QE committee deliberates the final decision.

The QE should attempt to assess the student's performance with respect to her/his ability of independent and critical analysis, including analytical skills specific to epidemiology, statistics, the Area of Interest, and the specialized topic; ability to apply principles and knowledge in the subject area; knowledge of current and contemporary issues in the student's proposed research; general knowledge of science; ability to integrate information and to reason based on examples or situations not necessarily related to her/his proposed research; and ability to hypothesize, extrapolate, and synthesize ideas.

Although the student will have passed the prequalifying written examination, and, therefore, will be assumed to possess a mastery of the material presented in the required GGE core courses, QE committee members may in the course of the examination address issues of mastery of core course material, as deemed necessary.

Assessment of student performance should consider the student's ability to defend methods and concepts, justify analyses, and critically assess the strengths and weaknesses of her/his proposed research, and to be able to provide appropriate reasoning behind the research. The student should be able to demonstrate an appropriate depth and breadth of knowledge in the area of her/his research.

Assessment of student performance should not be based on such factors as the nature of perceived scientific merit of the proposed research, future career goals, academic affiliations, faculty membership, or funding potential of proposed research.

Student performance on the QE as a whole is evaluated by all committee members. In reaching a committee agreement on overall assessment, each member should evaluate the student's performance on: a) epidemiology, statistics, the Area of Interest, and the specialized topic; and b) on the examination overall.

Five outcomes of the first QE are possible:

- A student may pass
- A student may not pass all or part of the examination
- A student may fail the QE
- A "no exam" may be declared
- A "split vote" may be cast by the QE committee

In order to declare a pass, the QE committee must be unanimous in agreeing that the student has passed each of the four areas of the examination and the examination overall. A pass on the qualifying exam indicates that the student's performance has been judged to be of sufficiently high quality to recommend her/him to be advanced to candidacy to pursue the formal research phase of their graduate education in epidemiology.

G. PhD Dissertation Information

The GGE operates under the Graduate Studies Plan B for dissertations. Students must submit a dissertation approved by the dissertation committee, which is composed of 3-5 faculty members who guide the candidate in her/his research and pass upon the merits of the dissertation.

Selection of the Dissertation Committee

The graduate advisor nominates to Graduate Studies 3-5 members of the dissertation committee after consultation with the student. These faculty members guide the candidate in the research phase and approve the dissertation.

Qualifications for membership on the dissertation committee are the same as for members of the QE committee. The student should consult with her/his major professor about membership before meeting with the graduate advisor.

The chair of the dissertation committee (major professor) and at least one other member must be members of the GGE.

Once a committee has been constituted, changes in membership may cause hardship for students as well as additional workload for Graduate Studies. Disagreement over the quality of a student's performance is not a legitimate reason for a member to be asked to be removed from a committee or for her/him to be replaced. Acceptable reasons for replacement of a member are: 1) extended absence from the campus, 2) illness, or 3) a substantial and justified change in the student's research topic. When membership changes must be made, the graduate advisor should nominate a new committee member giving reason for the change. For any change once a committee has been constituted, the graduate advisor must submit a statement of the reason for the request for change, and the reason must be acceptable to the dean of Graduate Studies. A Reconstitution of Committee form must be completed and approved by Graduate Studies if any changes are made to an approved committee.

The Dissertation Topic

A dissertation on a subject chosen by the candidate and adhering to the guidelines listed below must be approved by the dissertation committee and by the Graduate Council. A degree cannot be granted only on the basis of completion of a course of study, however extensive. A doctoral student who, after a written warning from the dissertation committee, has not made acceptable progress on a dissertation for at least a year, may be subject to disqualification.

The format of the dissertation typically includes the following sections:

- Introduction
- Critical review of the literature
- At least three chapters, each representing a publishable paper in journal-ready format for a peer-reviewed journal
- Summary

A monograph format may be used if deemed appropriate by the student's dissertation committee. It is strongly recommended that at least one manuscript derived from the dissertation be submitted for publication in a peer-reviewed journal before the dissertation is approved. Instructions on the dissertation format are available from Graduate Studies.

Dissertation Exit Seminar

All students must present their dissertations before their dissertation committee in a GGE exit seminar announced and open to the public. The seminar is expected to be a well-organized and succinct presentation of the research. Faculty should be aware that the quality of the dissertation exit seminar is reflective of the quality of support and guidance provided by the dissertation committee. The student will make one copy of the dissertation draft available to faculty and students at least one week before the scheduled public exit seminar. The exit seminar is to be announced to the GGE in writing with a brief abstract at least 2 weeks prior to the seminar.

Dissertation Defense

A dissertation defense, separate from the required exit seminar, may be required at the discretion of the dissertation committee. The committee should require a defense if no papers have been published or accepted for publication and the dissertation is not in the form of manuscripts for publication. If the student has papers already published (or accepted for publication) from the dissertation, the defense need not be required. If the dissertation is in the form of manuscripts for publication but they have not been published or accepted yet, the committee will decide whether to recommend a defense. The student must be notified by the dissertation committee well in advance of the exit seminar if a defense is required and may be cancelled by that committee if it feels the performance on the exit seminar was sufficient.

Filing the Dissertation

For information and assistance in the preparation of your thesis or dissertation, please contact the Graduate Studies Student Affairs Officer responsible for your program. You must make an appointment with the Student Affairs Officer in order to file your thesis or dissertation. To find your assigned Student Affairs Officer in Graduate Studies, go to the [Graduate Programs page](#), click on your program, and then click on "People." You will find their name and contact information there.

You are responsible for observing the [filing dates](#) and for preparing the thesis in the proper format. As part of the electronic filing process you will complete the PQIL Masters Thesis Agreement (Master's students) or the UMI Doctoral Dissertation Agreement (PhD students) on which you indicate your willingness to have the University supply copies of your thesis to interested persons immediately, or the dissertation submitted to ProQuest.

You **MUST** have committee approval (title page signed of by ALL committee members) before submitting your thesis/dissertation electronically.

There are sample Title Pages, Sample Abstracts, and electronic submission instructions on the Graduate Studies web page at <https://gradstudies.ucdavis.edu/current-students/academic-services-information/filing-thesis-or-dissertation>.

H. Advancement to Candidacy

Upon successful completion of the qualifying examination, the student is sent an application for advancement to candidacy by Graduate Studies. After the application is completed and signed by the graduate advisor and major professor, the student pays the advancement to candidacy fee at the cashier's office and returns the form to Graduate Studies. When the application is submitted to the graduate advisor for signature, a letter should accompany it from the proposed major professor (chair of the dissertation committee) recommending faculty for the dissertation committee. Upon advancement to candidacy for the degree, the dissertation committee will be appointed to direct the student in her/his research problem and to guide in the preparation of the dissertation.

Nonresident Tuition Reduction after Advancement to Candidacy:

Nonresident PhD students who have advanced to candidacy by the first day of fall quarter are eligible for a 75% reduction of the tuition charge beginning that fall quarter. The student is eligible for the reduced charge for up to 3 years after advancement to candidacy. After 3 years if the student has not completed their degree, the charge will revert to whatever is in place at that time.

I. Transfer of Credit

With the consent of the graduate advisor and the dean of Graduate Studies, some work taken elsewhere may be credited toward degree requirements. The limit for the transfer of such credit is six units from another institution or up to one half of the unit requirement from another campus of the University of California, if the units were not used to satisfy the requirements for another degree. In accordance with the [Graduate Council's Transfer Credit Statute of Limitations Policy](#), for coursework taken so long ago that the course material is no longer current, the graduate advisor may decline to approve the transfer. Another concern is that students may not recall information from courses taken many years in the past.

Concurrent Courses

A student may be allowed to transfer up to twelve units of credit for upper division and graduate work taken through UC Davis Open Campus (Extension) courses prior to admission to a graduate program (see below). A letter from the graduate advisor indicating approval of the transfer must be sent to Graduate Studies before the transfer can be made. The student will be required to submit an official copy of the current University Extension transcript if one is not already on file in Graduate Studies. Students will receive unit and grade point credit for their transferred concurrent coursework.

Summer Sessions

Credit for work taken during the Davis summer sessions prior to admission may be transferred towards the graduate program provided the work was done after receipt of the bachelor's degree and was not a requirement for admission.

Undergraduate Status

Under current regulations at UC Davis, as many as six units of graduate coursework taken by a student in undergraduate status may be credited towards a graduate degree program provided they were not used in satisfaction of the unit or any other requirements for the bachelor's degree. Only 200-level courses are eligible for transfer.

University Extension

By Academic Senate regulation, University Extension X300-level courses cannot be used to satisfy unit requirements for graduate degrees.

University of California

Up to one half of the unit requirement may be transferred from graduate level enrollment at another UC campus. Grade points and residency are transferable.

J. PELP, In Absentia, and Filing Fee Status

Filing Fee Status

The filing fee was established expressly to assist those students who had completed all requirements for degrees except filing theses or dissertations and/or taking formal final examinations (master's comprehensive examinations or doctoral dissertation defenses).

Eligibility for Filing Fee

To prevent abuses of the filing fee, definite limitations on eligibility for the status have been established. In general, these limitations are based upon the principle that students using University facilities or making demands upon faculty time - other than the time involved in the final reading of dissertations or theses or in holding final examinations - are not eligible to employ the filing fee status.

Students on filing fee status are not registered students eligible for the privileges accorded regularly enrolled students. In particular, students on filing fee status:

- May not make use of university educational facilities, such as the library (unless the student has purchased a library use card) or laboratories;
- Are not eligible for the services of the University Health Center or for university housing;
- May not take coursework of any kind;
- May not make use of faculty time except as noted above;
- May not hold any academic student appointment titles (e.g., Graduate Student Researcher, Teaching Assistant, Post Graduate Researcher, Associate In, Graduate Reader);
- May not receive a fellowship or financial aid.

Students who plan to make use of the library or other facilities or to take courses must register as regular students. Students who plan to be away from the campus but to be in an instructional relationship with faculty members must register as regular students (a student outside the state of California may be eligible to register for reduced fees). Students planning to take the QE for the PhD must register as regular students. Completion of formal coursework or residency requirements does not entitle a student to apply for the filing fee status unless s/he will use no university facilities or faculty time except as noted above.

Students wishing to make use of the filing fee status should secure a filing fee application from the Graduate Division, obtain the signatures of the graduate advisor and major professor, and return the form to the Graduate Division before s/he or he stops registering. The filing fee is payable at the time the application is submitted to the Graduate Division. The filing fee is assessed only once.

Planned Education Leave Program (PELP)

PELP is to be used for an actual leave from the university during which the student may resolve personal, financial or medical problems. Students may not hold student employment (TA, GSR) while on PELP and can only use PELP for a maximum of 3 quarters, with the approval of the graduate advisor and Graduate Studies' associate dean for students. International students must get prior approval from SISS for PELP status. For more information, see [the Grad Studies PELP guide](#).

In Absentia

Students who have already advanced to candidacy and will be conducting research outside of California are eligible to apply for *in absentia* status. The expectation is that during the status, there will be no significant in-person collaboration with UC faculty (indirect supervision via correspondence or review of written work is okay). This status is allowed for up to two years for PhD students and up to 1 year for MS students. For more information, see this [form](#) and this [FAQ](#).

K. Transfer Between MS and PhD Programs

Transfer from MS to PhD Program

MS students who desire to enter the PhD program must have at least a 3.3 GPA in courses taken while enrolled in the MS option, in addition to receiving a letter of recommendation from the proposed major professor. Students then petition the committee of graduate advisors (who should consult with the admissions committee) for a change of degree objective (MS to PhD).

Transfer from PhD to MS Program

The GGE Educational Policy Committee considered the following four scenarios in which a student may be in the PhD program and transfer to the MS program and made recommendations for each:

1. The student **passes** the PhD **written** exam **but not** the qualifying (**oral**) exam. This by itself is not sufficient for a MS degree because one of the two plans (thesis or oral exam) must be satisfied to fulfill degree requirements.

The oral exam committee can decide if an MS level of proficiency was demonstrated, and if the student petitions to change to the MS program, the committee can recommend a passing result for an MS oral exam.

The oral exam committee can decide that proficiency was not demonstrated at either the PhD or MS level, but the student can still petition to change to the MS program. The committee can recommend the student enter the thesis plan; however, the student may select the oral exam plan.

2. The student **does not pass** the PhD written exam and has thus not demonstrated basic competency in the discipline. A student in this situation cannot be automatically moved into the MS program. However, the student may petition to the graduate advisors committee (who should consult with the admissions committee) to move into the MS program in either the thesis or oral exam plan.
3. The student may, after 3 quarters and prior to taking the PhD prequalifying written exam, petition to the committee of graduate advisors (who should consult with the admissions committee) to move into the MS program in either the thesis or oral exam plan (if the student's academic performance meets the requirement of the MS program, including a minimum GPA of 3.0 in all upper and lower division and graduate level courses taken while in the PhD program).
4. The student **passes** both the PhD prequalifying written exam and the oral qualifying exam, but is unable to complete his or her dissertation within the allowable period (i.e., 3 years with an additional year of probation after the successful completion of the qualifying exam). Such a student has effectively met all the requirements of the MS program and should be encouraged to change her/his degree objectives accordingly.

L. Double Majors

The minimum GPA normally required for admission to a double major is 3.3. Applicants for admission to two graduate programs administered by Graduate Studies must file the Petition for Double Major along with the regular Graduate Studies application, application fee and transcripts.

Under a ruling by the Graduate Council, a student who is in a double major program (either a professional degree/academic degree program or two academic degree programs) may transfer a total of 12 units overall between academic programs with the approval of the graduate advisor and the dean of Graduate Studies. The student must spend a minimum of two quarters in regular graduate standing in the master's program to fulfill the residency requirements of Graduate Studies.

M. Academic Resources

Office of Graduate Studies

The Office of Graduate Studies, commonly referred to as simply “Grad Studies,” is located at 250 Mrak Hall. Since you’ve already been accepted to UC Davis, you’ve no doubt already visited its website. Grad Studies has a wealth of information on its [website](#). If you have a question about anything and can’t find someone to ask, check out the website. It contains information on fees, funding, living in Davis, deadlines, degree requirements, forms, teaching assistant (TA)/Graduate Student Researcher (GSR) positions, residency status, etc. The GGE contact in the Office of Graduate Studies is: Laura Young, leyoung@ucdavis.edu.

Campus Libraries

The main library on campus is the [Shields University Library](#) and you should take time to become familiar with it because it provides great services and resources. The library provides tours of its facilities throughout the year and also provides regularly scheduled tours during the first two weeks of fall quarter. The Shields Library is home to one of the many computer labs on campus and also houses [I.T. Express](#), the place where you go to set up your UC Davis email account and set your login ID and password. I.T. Express also sells software for installing the UC Davis email program on your home computer for a small fee. As epidemiology students, you will mostly likely utilize the [Carlson Health Science Library](#) as well. It is located on the medical and veterinary school campus.

Graduate Student Association (GSA)

The [UC Davis Graduate Student Association \(GSA\)](#) is a student-driven representative organization, linking students of the diverse graduate programs. Funded by graduate student fees, GSA provides services to graduate students and protects and promotes their interests at all levels of University administration. Regularly enrolled graduate students, professional students in the Graduate School of Management, and professional students in the teaching credential program are automatically GSA members. The GSA offers coffee and donuts every Friday from 9 am to noon, holds social events throughout the school year, and offers travel awards to graduate students. The GSA office/lounge is located at 253 South Silo.

Cowell Student Health Center

The [Cowell Student Health Center](#) offers primary health care for students, including general and specialty clinics. Services and facilities include X-ray, laboratory, pharmacy, physical therapy, and a women’s clinic. General information: (530) 752-2300; advice nurse: 752-9649; appointments: 752-2349.

For students with families (spouses and children), restrictions exist for family members to be included in the graduate student’s health care policy. These restrictions differ for domestic and international students. If you require health care for your family, be sure to get information from Cowell Health Center directly regarding this issue.

Professionals are available to help manage psychological problems, depression, stress management, etc. through Cowell Health Center. Some of these costs are covered under your graduate health insurance with the university. If you are having any such concerns, you can call the counseling department of the Cowell Health Center at 530/752-0871 or contact them through email address listed on their [website](#).

Transportation and Parking Services (TAPS)

Are you going to bring a car to UC Davis and are you going to drive it to campus? You have to buy a parking permit and [TAPS](#) is the place to do this. A parking permit costs ~ \$418 for the entire year (prices are based on the starting date of the permit and the parking location, so they may vary). The prices could increase at any time. The other main function of TAPS is to issue bicycle licenses. The permits are \$8 for a two-year period (\$4 to renew), your bike will be registered and, if stolen, you'll have a much better chance of retrieving it.

Office of the University Registrar

The [Registrar's website](#) is where to go to view the on-line General Catalog, course schedule, important dates, transcript information, a class search tool, graduation information, changing student status (such as PELP, part-time status, etc.) and more.

Student Accounting

[Student Accounting](#) assists campus faculty, staff, and students in meeting their teaching, research, and operational needs by providing the most effective and efficient disbursement of student financial aid.

Mentoring Guidelines

[Faculty mentoring guidelines](#), approved by the UC Davis Graduate Council on June 24, 1999. Students should be aware of these expectations as well.

N. Forms and Links

Websites and URLs Linked to in this Handbook

[Carlson Health Science Library](http://www.lib.ucdavis.edu/healthsci/) (<http://www.lib.ucdavis.edu/healthsci/>)

[GGE faculty](http://www.vetmed.ucdavis.edu/phr/faculty/index.cfm) (<http://www.vetmed.ucdavis.edu/phr/faculty/index.cfm>)

[GGE policies and guidelines](http://www.vetmed.ucdavis.edu/gge/policies_guidelines/index.cfm)

(http://www.vetmed.ucdavis.edu/gge/policies_guidelines/index.cfm)

[Graduate Council policy on doctoral qualifying examinations](https://gradstudies.ucdavis.edu/sites/default/files/upload/files/grad-council/qe_policy_approved_4-1-2011.pdf)

(https://gradstudies.ucdavis.edu/sites/default/files/upload/files/grad-council/qe_policy_approved_4-1-2011.pdf)

[Graduate Student Childcare Grant](http://worklife-wellness.ucdavis.edu/family_care/children/childcaresub.html) ([http://worklife-](http://worklife-wellness.ucdavis.edu/family_care/children/childcaresub.html)

[wellness.ucdavis.edu/family_care/children/childcaresub.html](http://worklife-wellness.ucdavis.edu/family_care/children/childcaresub.html))

[Harassment & Discrimination Assistance and Prevention Program](https://hdapp.ucdavis.edu/) (<https://hdapp.ucdavis.edu/>)

[Information for international students](https://gradstudies.ucdavis.edu/prospective-students/admissions-application/international-applicants) (<https://gradstudies.ucdavis.edu/prospective-students/admissions-application/international-applicants>)

[In Absentia form](http://gradstudies.ucdavis.edu/sites/default/files/upload/files/current-students/g3308-in-absentia-registration.pdf) (<http://gradstudies.ucdavis.edu/sites/default/files/upload/files/current-students/g3308-in-absentia-registration.pdf>)

[In Absentia information](http://gradstudies.ucdavis.edu/current-students/admissions-academic-services/absentia-faq) (<http://gradstudies.ucdavis.edu/current-students/admissions-academic-services/absentia-faq>)

[Information on PELP](http://gradstudies.ucdavis.edu/sites/default/files/upload/files/current-students/g338-pelp.pdf) (<http://gradstudies.ucdavis.edu/sites/default/files/upload/files/current-students/g338-pelp.pdf>)

[I.T. Express](http://itexpress.ucdavis.edu/) (<http://itexpress.ucdavis.edu/>)

[Mentoring Guidelines](https://gradstudies.ucdavis.edu/sites/default/files/upload/files/grad-council/mentoring.pdf) (<https://gradstudies.ucdavis.edu/sites/default/files/upload/files/grad-council/mentoring.pdf>)

[Office of Graduate Studies website](https://gradstudies.ucdavis.edu/) (<https://gradstudies.ucdavis.edu/>)

[Office of Graduate Studies financial support information](https://gradstudies.ucdavis.edu/current-students/financial-support)

(<https://gradstudies.ucdavis.edu/current-students/financial-support>)

[Registrar](https://registrar.ucdavis.edu/) (<https://registrar.ucdavis.edu/>)

[Services for International Students & Scholars \(SISS\) website](http://siss.ucdavis.edu/) (<http://siss.ucdavis.edu/>)

[Shields University Library](http://www.lib.ucdavis.edu/) (<http://www.lib.ucdavis.edu/>)

[SISWEB](http://sisweb.ucdavis.edu/) (<http://sisweb.ucdavis.edu/>)

[Student accounting](http://afs.ucdavis.edu/our_services/student-accounting/index.html) (http://afs.ucdavis.edu/our_services/student-accounting/index.html)

[Student health and counseling services](https://shcs.ucdavis.edu/) (<https://shcs.ucdavis.edu/>)

[Student Judicial Affairs](http://sja.ucdavis.edu/) (<http://sja.ucdavis.edu/>)

[Transportation & Parking Services](http://www.taps.ucdavis.edu/) (<http://www.taps.ucdavis.edu/>)

[UC Davis bookstore](http://ucdavisstores.com/home.aspx) (<http://ucdavisstores.com/home.aspx>)

[UC Davis Graduate Student Association \(GSA\)](http://gsa.ucdavis.edu/) (<http://gsa.ucdavis.edu/>)

[UC Davis online course catalog](http://registrar.ucdavis.edu/UCDWebCatalog/programs.html) (<http://registrar.ucdavis.edu/UCDWebCatalog/programs.html>)

[UC Student Workers Union](http://www.uaw2865.org/) (<http://www.uaw2865.org/>)

(http://bookstore.ucdavis.edu/generalcatalog_classschedule.cfm)

Forms

[Graduate Studies list of forms](https://gradstudies.ucdavis.edu/current-students/forms-information) (<https://gradstudies.ucdavis.edu/current-students/forms-information>)

Appendix A. Dissertation Proposal Outline

Project Title

A brief, clear, specific designation of the subject of the research. The title, used by itself, should reflect the objectives and scope of the project.

Abstract

The proposal must contain an abstract, not to exceed one page single-spaced. The summary is not intended for the general reader; consequently, it may contain technical language comprehensible by persons in disciplines relating to the subject of the project. The abstract should be self-contained, with a specific description of the activity to be undertaken and should focus on:

- Overall project goal(s) and supporting objectives
- Plans to accomplish project goal(s)
- Relevance of the project to potential long-range improvement in plant, animal, and/or human health

Proposal

The text of the proposal should not exceed 10 single-spaced pages. All proposals should be submitted on standard 8.5" x 11" paper. In addition, margins must be at least 1", type size should be 12 characters per inch or larger, and there should be no page reductions. The proposal must contain the following components:

- **Background/Introduction.** A clear statement of the long-term goal(s) and supporting objectives of the proposed dissertation should be included. The most significant published work in the field under consideration should be reviewed. The current status of research in this field of science also should be described. Preliminary data pertinent to the proposed research should be included in this section. Indicate the additional knowledge needed, which the research is expected to provide.
- **Three chapters.** The dissertation proposal should have at least one page, single-spaced on each chapter. The following sections should be covered for each chapter:
 - **Objectives/Aims.** Provide the main objectives or aims of the chapter, detailing what you hope to accomplish with the proposed research.
 - **Hypothesis.** Provide a clear, logically arranged, and succinct statement of each research hypothesis being tested. For each, also provide the respective alternative hypothesis.
 - **Methods/Experimental Plan.** For each hypothesis describe the following:
 - A description of the investigations and/or experiments proposed in the sequence in which the investigations or experiments are to be performed.
 - Describe all sources of bias (error) that may be present and specifically how the bias will be avoided, corrected, or controlled. Provide calculations for estimation of sample sizes.
 - Techniques to be used in carrying out the proposed project, including the feasibility of the techniques
 - Results expected (provide examples)
 - Means by which experimental data will be analyzed or interpreted
 - Means of applying results or accomplishing technology transfer, where appropriate

- Pitfalls that may be encountered
- Limitations to proposed procedures
- A tentative schedule for conducting major steps involved in these investigations and/or experiments. Provide an estimate of the maximum time likely to be required to complete the project and publish results.
- **Rationale and Significance.** Present concisely the rationale behind the proposed research. The objectives' specific relationship to the potential long-range improvement in plant, animal, and/or human health should be shown clearly. Any novel ideas or contributions that the proposed dissertation offers also should be discussed in this section. The facts and reasoning that logically support the hypothesis should be stated clearly (What is the factual and logical justification for each hypothesis?).
- **Literature Cited.** Provide a reference list of pertinent literature cited in the proposal.