

GGB MS Comprehensive Exam Guidelines

The MS comprehensive exam is an opportunity to evaluate a student's knowledge of biostatistics in the context of a short-term (3-week) data analysis project. Of particular interest will be the choice in analytic strategies used to address specific scientific questions and the ability to adequately describe and present the background, methods, results and conclusions of the project. The exam itself consists of a data analysis, a write-up of the project in the form of a scientific manuscript, and an oral presentation/defense of the project during which the student will be examined by the committee, consisting of two permanent members and the student's Chair.

First Steps for the Student

Each student is expected to identify the Chair for their MS Comprehensive Exam

Committee. This should be done ideally by the end of the quarter before the student plans to graduate but no later than the end of the third week of the quarter in which the student plans to graduate. The Chair must be a member of the Graduate Group in Biostatistics who is willing to provide a dataset, scientific questions of interest related to the data, relevant background and general guidance during the exam. Students may work with their Graduate Advisor to identify a person who agrees to serve in this role. Once the Chair is identified, please notify the Graduate Advisor (either Dan Tancredi: djtancredi@ucdavis.edu or Lihong Qi: lhqi@ucdavis.edu), the MS Program Coordinator (Andi Carr: abcarr@ucdavis.edu), and the GGB Chair (Danielle Harvey: djharvey@ucdavis.edu).

The student should then find a 2-hour time slot later in the quarter they plan to graduate that works for the MS Comprehensive Exam Committee. The names of the two permanent members of the exam committee should be posted on the Graduate Group in Biostatistics website, but if the information is not available, the students should check with the Master's Program Coordinator, Andi Carr, who can provide the names. *Students need to have at least 4 weeks between the scheduling of the exam and the actual exam date to allow for 3 weeks for the analysis and writing of the report and 1 week for the committee to read the report.* Note that students are often asked to perform additional work and/or revise the report after the exam and sometimes, a retake of the exam is required, so it is better not to schedule the exam too close to the end of the quarter; students may have to postpone graduation until the following quarter if they are unable to satisfactorily complete the work and report or pass a retake, if applicable, before the end of the quarter. Once a date and time is determined, Andi can assist with reserving a room for the exam.

Responsibilities of the Chair

The Chair of the MS Comprehensive Exam Committee is a GGB faculty member who agrees to provide a dataset and general guidance to the student throughout the exam process. The dataset should not be one the student has worked with before. Examples of datasets that have been used in the past include publicly available data, data from a past research project in which the Chair was involved, and well documented data from collaborators; note that exact questions that have already been addressed in publications for a specific dataset are not acceptable, as students are supposed to come up with their own ideas for analyses and not simply replicate an analysis that is already in the literature. In addition to the dataset, the Chair should provide the

student with scientific questions of interest, a data dictionary for the variables included in the data set, and some background information that would be useful for the project, including the objective(s) and the design of the study.

The dataset and assignment should be provided by the Chair to the student exactly 4 weeks before the date of the scheduled exam, to provide the student 3 weeks to carry out the analysis and write up the report and to give the committee members one week to read the completed report; note that if the exam is scheduled more than 4 weeks ahead of time, the Chair must wait until 4 weeks prior to distribute the data. During the 3 weeks when the student is analyzing the data and writing up the report, the Chair should be available to answer clarification questions regarding the data. In general, the choice of analytic techniques used should be up to the student, although the Chair can provide comments along the way regarding issues the student may want to consider. The Chair may also provide guidance on the report, though the writing should be the work of the student. Should there be a need, the Chair may also help the student finalize the report after the exam, taking into consideration any comments that arise during the oral portion of the examination.

Responsibilities of the Student

In addition to identifying a Chair and scheduling the exam, the student is responsible for reading any background material provided by the Chair, reviewing the scientific questions for clarity, and understanding the data. The student is strongly encouraged to review relevant literature as needed in order to gain clear understanding of the scientific aspect of the project. The student should decide how to best analyze the data to address the scientific questions of interest posed by the Chair. The student has 3 weeks in which to analyze the data and write up a report in the form of a scientific manuscript.

The report should be emailed to the committee 1 week prior to the oral portion of the exam.

The student should also send a brief abstract to Andi Carr (abcarr@ucdavis.edu) 1 week before the exam so that it may be circulated among the GGB students and faculty. GGB students and faculty are invited to attend the first hour of the oral exam.

The report should consist of an Abstract and 4 main sections:

- 1) an Introduction that provides a brief background about what is known about the scientific questions of interest and describes the key questions of interest;
- 2) a Methods section that describes the study from which the data come including the design of the study, key measures used for outcomes or predictors, and the statistical methods used for analysis; this section should be detailed enough that a person reading it should be able to reproduce the analyses, provided they had access to the data;
- 3) a Results section which presents the results of the analyses; and
- 4) a Discussion/Conclusion section in which the main findings are highlighted and put into context within the literature and next steps in research are described. Reports should be no more than 10 pages, single spaced (not counting references and supplemental material, such as appendices), ideally with key figures and tables integrated into the text as in a published article.

For the oral portion of the exam, the student should prepare a presentation (aiming for 30 slides, but no more than 35 slides; about a 40-minute presentation) that goes through the key

sections of the report. The first hour of the exam is open, so that other students or faculty may sit in during that time. The student should be prepared to answer questions about the study from which the data come, the variables analyzed, the methods used and rationale behind choosing those methods, the interpretation of findings, the choice of tables and/or figures used to highlight or illustrate findings, and the overall conclusions. The exam committee members will likely ask questions throughout the presentation, rather than wait until the end of the presentation, so students should anticipate not getting through their entire presentation without interruption.

Possible Outcomes of the Exam

The possible outcomes of the exam include Pass or Fail, although the committee may withhold a decision pending a revision of the analysis and/or report. Many students are asked to address questions/issues raised during the exam and once those are adequately addressed, the committee will make a decision.

If a student should fail the exam, the student has one more chance to pass the exam. The second attempt must be made before the end of the next quarter; if the first attempt is made in Spring, the second attempt must be made over the summer. Failure to pass the comprehensive exam at the second attempt will result in a recommendation to the Dean of Graduate Studies for disqualification of the student from the graduate program.

SUMMARY:

- 1 – Identify your exam Chair
- 2 – Notify your advisor, the Dept Chair and the Program Coordinator of who the Chair will be
- 3 – Schedule your oral exam. Please include all 4 [committee members](#) on the emails for scheduling, so you can get availability for all 4. Danielle will make the determination of the committee for each student based on availability
- 4 – Review relevant literature, analyze data & write up a report
- 5 – Send report to the committee 1 week prior to the oral portion of the exam
- 6 – Provide report abstract to Program Coordinator at least 1 week before oral exam
- 7 – Prepare presentation for oral exam

RESOURCES:

Helpful for scheduling: <https://www.when2meet.com/>

Instructions: Type in your name and click "Sign In" (you don't need a password). The pink calendar will appear. Drag across the calendar to make your *available* dates turn green. It saves automatically.

Exam Committee members can be found on this page:
<https://biostatistics.ucdavis.edu/committees>