PhD Oral Qualifying Examination

Purpose of the Examination

A scientist at the PhD level has the ability to identify a significant and substantial research area within his/her field, pose non-trivial questions about a significant aspect of the research area, design experiments to provide unequivocal answers to those questions, perform the experiments and interpret the data. A successful PhD-level scientist must also have the ability to communicate his rationale, results and interpretations to others, such as employers, laboratory directors, granting agencies and journal editors and peers. The Oral Qualifying Examination in the Graduate Group in Food Science is intended to test a student’s ability to carry out these tasks. In particular, it tests the depth of the student’s knowledge in the area of emphasis and his/her ability to use this knowledge to form a hypothesis and devise a realistic method to test it. The student’s description of the problem and its significance along with an experimental approach and rationale for interpretation of the data constitute his thesis proposal. Presentation of the thesis proposal is the first part of the exam.

In addition, because the PhD is being awarded in Food Science, not the area of interest, the exam also tests the breadth of a student’s knowledge in Food Science. The level of knowledge in areas outside the student’s area of emphasis is expected to be about that of the first-year courses in our graduate program and standard textbooks.

Timing of the Examination

The examination is normally taken toward the end of the second year, when all required courses have been taken, or are in progress. Exceptions can be made “in exceptional cases”, with the consent of the executive committee and concurrence of academic and thesis advisors.

Format of the Examination

Part 1. The student is to present his/her thesis proposal in the form of a seminar without the aid of slides. The presentation provides the basis for substantial interactive questioning by committee members. The student should therefore prepare a self-contained talk that can be completed in about fifteen minutes if presented without interruption. The committee is expected to interrupt the presentation with relevant questions, and this portion of the exam should last between one and two hours. The thesis project as well as tangentially-related material of significance to the project, may be addressed in the questioning.

Part 2. The second portion of the examination is interactive questioning by committee members that focus on out-of-area-of-emphasis material, whether related to the thesis project or not. The three areas of focus are Food Chemistry/biochemistry, Food Microbiology and Food Processing/Engineering. The student’s proposal falls into one of these categories (and is declared on the form requesting assignment of a committee), and at least one member of the committee will focus on each of the other two areas.

The student will not refer to notes or prepared figures (slides, overheads, videos, etc.), except in special cases, with the permission of the Committee Chair. Figures that are critical to the Committee’s understanding of the proposal or preliminary data may be included in the write-up.
Nature of the Write-up

The student will prepare a written version of the proposal and distribute it no less than one week before the scheduled date of the examination. The written proposal should set out the background, justification, specific aims, procedures and methods of data analysis. References to the key literature must be given, and preliminary data may be included. The proposal should be of modest length; this is an oral exam, not a written exam, and the written proposal does not constitute a pre-examination. It is simply a document to help orient the committee and allow them to formulate questions or familiarize themselves with the literature. The written proposal should be prepared by the student. The research advisor should provide guidance, but the final document must be the product of the student’s intellect if the exam is to have any meaning.

The student should discuss the written proposal with the chair of the committee before distributing it to the committee. It is the responsibility of the chair to verify that the written proposal is appropriate in a general sense, i.e., that it conforms to the expectation of the group in style, degree of detail and general content. However, the chair is not responsible for providing a detailed scientific critique of the project or of the proposal; the chair does not conduct a pre-examination.

Composition of the Committee

The examination committee consists of five members, no less than four of whom are Senate members; the research advisor is specifically excluded. One member is from outside the graduate group, but (usually) in the field of research of the student. Two of the members are from outside the area of emphasis of the student (chemistry/biology, microbiology/food safety, processing/food engineering) and will examine the student in those areas during the second part of the exam.

Charge to the Committee

Criteria. The Committee is to base its decision on the student’s mastery of the material, the quality of the proposal, and the student’s ability to present it persuasively.

The committee is charged with deciding whether the student will be able to conceive and conduct independent research projects after receiving this degree. To some extent, the committee is handicapped by the fact that the thesis project may well have been originated by the thesis advisor as, for instance, part of grant proposal submitted to a federal agency. Realistically, then, the committee must decide whether the student is a substantial intellectual contributor to the project, or merely a technician who understands his or her instructions.

The quality of the project itself must also be evaluated. The project must not be simple data gathering, and unlike a MS project, it must extend beyond masterful application of existing techniques or information. A project with ample justification and testable hypotheses is expected. If the project is not of substantial depth or does not contain a testable hypothesis, the committee should consider rendering a “not pass” decision, and require the student to reformulate the proposal so that it meets these criteria (i.e., retake the examination).
The extent of the student’s knowledge, judged separately from the quality or planned conduct of the project, should also meet the expectations of the committee. The committee should be guided by the following criteria:

The student’s command of the material outside the area of emphasis should be on the level of the first-year core graduate courses at Davis, and the prerequisites to those courses. Students cannot be expected to be experts in all aspects of food science. Within a student’s area of emphasis, his/her knowledge should extend beyond the level of courses and textbooks, to a reasonable awareness of the primary literature in the field.

**Options.** The only options available to the Committee are the following: Fail (immediate dismissal), Not Pass (to be resolved by further work or examination) or “Pass” (all requirements are completed except for submission and acceptance of the thesis, and exit seminar).

**Further requirements.** To resolve a “not pass” decision, the committee may require the student to
1. retake the exam or a portion of it within a specified time frame,
2. take additional coursework and receive a satisfactory grade,
3. serve as teaching assistant for a particular class, provided that such service can be arranged,
4. prepare a scholarly paper or essay on a relevant topic, or
5. perform a related activity to resolve shortcomings observed during the exam.

The committee is reminded that the purpose of requiring additional work is to fill deficiencies in the student’s background knowledge or to focus the student’s thinking on a particular subject or on the scientific approach employed in the thesis project. It is not intended to constitute punishment and should not impose undue hardship. However, it is the duty of the committee to ensure that our alumni meet the standards of the University of California.

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