



PH798 DISSERTATION RESEARCH and DISSERTATION

Course Description: Design and performance of research leading to a Ph.D.

Credit Hours: 1 semester hour

Course Prerequisites: Passage of the Qualifying Examination and admission into candidacy for the Ph.D. In most cases, those prerequisites will encompass the satisfactory completion of the specific courses required of both the Graduate School and the Pharmacology and Toxicology program. Note that at the end of dissertation research, a minimum of 60 credit hours – including a minimum of 45 hours for graded courses – is required for the Ph.D.

Course Dates: Fall, Spring, or Summer term

Course Times: TBA, but as required.

Course Location: Mentor's Lab

Instructor: Mentor

Required Text and Other Learning Resources: Publications pertaining to the area of research.

Course Overview: In consultation with the mentor and advisory committee, the student will design and conduct research to complete the aims identified in his/her research proposal or as modified subsequently in line with recommendations from the committee.

Course Objectives: Upon completion of this course, students will be able to:

1. form and design experiments to test hypotheses.
2. technically perform the requisite experiments.
3. organize, analysis and interpret experimental result.
4. describe the significance of experimental outcomes in a well-reasoned discussion.
5. defend the experimental approach, methods, and interpretation in an oral defense before the advisory committee.

Grading Policy and Rubric: The grade for Dissertation Research and Dissertation is pass or fail.

For those academic terms in which the student (candidate) is performing research, the determination as to whether or not adequate progress has been achieved will lay primarily with the mentor, with input from the faculty advisory committee. The criteria by which the

mentor will rate student performance is detailed in the evaluation template 'Evaluation of a Student's Laboratory Performance'.

It is expected that the candidate will meet regularly with the advisory committee to describe progress, difficulties and changes, if any, in experimental directions. In any event, at least one progress report to the advisory committee is required per academic year. The program director and department chair may also weigh in on decisions regarding student progress. If adequate progress has been achieved, a grade of pass is awarded. Alternatively, a grade of 'fail' is given, with likely dismissal from the program.

The final grade for Dissertation Research and Dissertation - and the determination of whether a Ph.D. is granted to the student - is based on three indications of the candidate's performance: the written dissertation, the public presentation and defense, and the private defense to the Advisory Committee.

The candidate will write and then defend a dissertation after the aims of the research proposal have been achieved – as agreed upon by the candidate, the mentor and other members of the Advisory Committee. A copy of the dissertation is to be submitted to each member of the Advisory Committee at least two weeks prior to the scheduled defense. The committee will read and evaluate the dissertation. Evaluation is based on criteria defined in the grading template '*Evaluation of a Student Research Paper*'. The candidate will also present a public seminar of the dissertation research; the members of the Advisory Committee and all other graduate faculty in attendance will evaluate the candidate's performance during the public presentation and defense using criteria defined in the grading template '*Evaluation of a Student Research Presentation*'. Finally, the Advisory Committee will examine the candidate in private. Members of the Advisory Committee may amend their scoring of the candidate on '*Evaluation of a Student Research Presentation*' on the basis of the candidate's ability to defend the dissertation in this forum. The Advisory Committee may also detail revisions to the dissertation that are required.

If the candidate's performance is satisfactory, a final grade of pass will be given, and the Advisory Committee will recommend, pending acceptable revision of the dissertation, that the Ph.D. be granted.

If the dissertation is deemed non-defendable, the Advisory Committee may recommend postponement of the presentation and defense to allow corrections of identified deficiencies. The Committee may also stipulate the time period in which such corrections must be completed. If the candidate's performance during the presentation and defense is not satisfactory, the Committee can recommend a reexamination (defense) or a grade of 'fail', with dismissal from the program. In either event, failure of the student to revise the dissertation or to present and defend the dissertation to the satisfaction of the majority of the Advisory Committee will result in a grade of 'fail' and a recommendation that the Ph.D. not be awarded.

Course Policies:

Requirements for Dissertation Research and Dissertation vary with the tenure of the candidate. Upon initial acceptance into candidacy, the candidate is expected to identify a faculty mentor and Advisory Committee, define a research project, prepare a research proposal detailing, at a minimum, a hypothesis, the specific aims and experimental

approach. Thereafter, the candidate is expected to confer regularly with the Advisory Committee and to present at least one seminar annually to the program faculty that will serve as a progress report. The final requirements for the Ph.D. are (1) a written dissertation of the candidate's original research, (2) a public oral presentation and defense of the dissertation research, (3) a separate defense of the dissertation to the Advisory Committee, and (4) a minimum of one peer-reviewed, first author publication related to original research performed by the candidate. A manuscript accepted for publication, but not yet in press, will satisfy the last requirement, but there must be a letter from the journal editor attesting to the acceptance.

Announcement of the public presentation and defense are made through the Graduate School. Once a date for the defense has been identified, the candidate or the program director submits to the Office of the Dean of the Graduate School the tentative date, the title of the dissertation, and a copy of each of the candidates publications. As noted above, a letter of acceptance from the editor must accompany any manuscript 'in press'. Upon receipt of those materials, the Office of the Dean of the Graduate School will make a public announcement of the pending presentation and defense. In the interim, the candidate may schedule the defense with the Advisory Committee.

University Policies:

Students with disabilities (ADA) statement Refer to UMC policy
Academic honesty statement Refer to UMC policy

Evaluation of a Student's Laboratory Performance (Pharm792, 798 and 799)

Student _____

Date _____

Mentor _____ Signature _____

This evaluation is to be completed by the mentor who directs the training of the student. The objectives for the rotation are to be set between the student and the mentor at the beginning of the rotation. The student is to be evaluated in each of the five major categories on the basis of the indicated criteria using a scale of increasing quality from 1 to 5, with 1 being the lowest (failure, F) and 5 being the highest (excellent, A⁺). Indicate NA if a criterion is not applicable. The sum of the criterion scores, in turn, determines the score for the category. The 'Grade' for this portion of the student's assessment will be calculated as the percentage of points obtained to total possible points, with criteria/categories marked as NA excluded. If completing the form electronically, a drop-down menu is available within each box from which you can select the appropriate criterion or category score. You can use the TAB key to navigate between boxes as well as text fields in the 'Comments' section.

Performance/Effort

- Attitude
- Initiative, Motivation
- Commitment, Dependability
- Independence
- Quantity of work (in relation to initial goals)

Laboratory/Technical Skills

- Basic bench skills
- Ability to find relevant literature
- Ability to identify relevant methods and apply them to laboratory problem
- Ability to learn new methods
- Quality of laboratory work

Intellectual Skills

- Application of scientific method and pharmacological principles
- Problem-solving/Trouble-shooting
- Interpretation of relevant literature, scientific data
- Independent thought
- Intellectual development (knowledge of field gained during rotation)

Administrative/Personal Skills

- Time management
- Efficiency
- Record keeping

Communication/Interpersonal Skills

- Communication with mentor
- Communication with other lab members
- Ability to work with other lab members
-

Follow through

meetings

Preparation, planning

meetings

Participation in (group) laboratory

Preparation for (group) laboratory

Faculty Comments

Strengths:

Areas for Improvement:

Other Comments:

Student Comments

Signature: _____

Date _____

Evaluation of a Student Research Presentation

Student: _____

Evaluator: _____

Date: _____

Please indicate the rank of the student being evaluated and the course, if applicable.

<input type="checkbox"/>	1 st year	course: _____
<input type="checkbox"/>	2 nd year	
<input type="checkbox"/>	3 rd year (qualifying exam, research proposal; progress report; thesis)	
<input type="checkbox"/>	4 th year+ (progress report; dissertation)	

Please rate the student in each of the major categories based on its respective criteria. A criterion is scored with a 0, if it is met infrequently or not at all (<25% of when applicable); 0.5, if it is met some of the time (25-75% of when applicable); and 1, if it is met most of the time (>75% of when applicable).

Then, criterion scores are summed to obtain a score for each category. The total score for each category should accurately reflect your perception of the student's performance. The relationship between the two should be

- 5, outstanding (A⁺).
- 4, very good (B⁺ to A).
- 3, adequate/good (B⁻ to B).
- 2, poor (D to C).
- 1, inadequate (F).

A mean score for all categories ≥ 3 , with a score ≤ 2 on no more than one category, is passing.

Preparation and Execution

- | | | |
|---|--------------------------|--------------------------|
| The speaker was prepared. | <input type="checkbox"/> | <input type="checkbox"/> |
| Text and figures were concise and legible. | <input type="checkbox"/> | |
| The speaker spoke clearly and at a pace that was easily followed. | <input type="checkbox"/> | |
| The speaker avoided mannerisms that distracted the audience. | <input type="checkbox"/> | |
| The speaker allowed time for questions and discussion. | <input type="checkbox"/> | |

Introduction and Hypothesis

- | | | |
|---|--------------------------|--------------------------|
| A succinct summary of current, pertinent knowledge was presented. | <input type="checkbox"/> | <input type="checkbox"/> |
| The background was appropriate for the audience. | <input type="checkbox"/> | |
| A knowledge gap or rationale for the studies was clearly defined. | <input type="checkbox"/> | |
| A problem, question or hypothesis was clearly stated. | <input type="checkbox"/> | |
| General goals or specific aims were defined. | <input type="checkbox"/> | |

Methods and Results

- | | | |
|--|--------------------------|--------------------------|
| A rationale for experimental design was provided. | <input type="checkbox"/> | <input type="checkbox"/> |
| The experiments actually tested the hypothesis or problem. | <input type="checkbox"/> | |
| Methods/experimental designs were explained sufficiently. | <input type="checkbox"/> | |
| Data were presented in a manner that allowed you to interpret results. | <input type="checkbox"/> | |
| Appropriate comparisons and (statistical) analyses were performed. | <input type="checkbox"/> | |

Logic and Conclusions

- | | | |
|---|--------------------------|--------------------------|
| Content followed a logical sequence; concepts built on one another. | <input type="checkbox"/> | <input type="checkbox"/> |
| Relationships between individual parts (experiments) or thoughts were apparent. | <input type="checkbox"/> | |
| Interpretation was consistent with the evidence presented. | <input type="checkbox"/> | |
| Conclusions were supported by the data. | <input type="checkbox"/> | |
| Additional questions, solutions to problems and/or future directions were identified. | <input type="checkbox"/> | |

General Preparedness and Effectiveness

- | | | |
|--|--------------------------|--------------------------|
| When entertaining questions, the speaker addressed what was asked. | <input type="checkbox"/> | <input type="checkbox"/> |
| The speaker knew the details of what was presented. | <input type="checkbox"/> | |
| The speaker was aware of relevant literature. | <input type="checkbox"/> | |
| The speaker kept your attention. | <input type="checkbox"/> | |
| There was a clear 'take home' message. | <input type="checkbox"/> | |

Please provide any written comments on the back of this sheet.

Evaluation of a Student Research Paper

Student: _____

Evaluator: _____

Date: _____

Please indicate the rank of the student being evaluated and the course, if applicable.

	1 st year	course: _____
	2 nd year	
	3 rd year (research proposal; progress report; thesis)	
	4 th year+ (progress report; dissertation)	

Please assess the document in each of the major categories based on its respective criteria. A criterion is scored with a 0, if it is met little or not at all (<25% of when applicable); 0.5, if it is met much of the time (25-75% of when applicable); and 1, if it is met most (>75%) of the time.

Then, criterion scores are summed to obtain a score for each category. The total score for each category should accurately reflect your perception of the student's performance. The relationship between the two should be roughly:

- ≥5, outstanding (A⁺).
- 4, very good (B⁻ to A).
- 3, adequate/good (B⁻ to B).
- 2, poor (D to C).
- 1, inadequate (F).

A mean score for all categories ≥3, with a score ≤2 on no more than one category, is passing.

Introduction, Hypothesis and Aims

- A succinct summary of current, pertinent knowledge is presented.
- The rationale for the (proposed) studies is clearly defined.
- The (proposed) research relates to a current research need or knowledge gap.
- A problem, question or hypothesis is clearly stated.
- General goals or specific aims that test the hypothesis are defined.

Methods and Experimental Design

- A rationale for the experiments is provided.
- Appropriate controls are included in the experimental design.
- The experiments test the hypothesis or problem; experimental end-points are appropriate.
- Methods/experimental designs are explained sufficiently.
- Limitations of design/methods and alternative approaches are discussed.

Results and Analyses (as applicable)

- Relationships between individual experiments are apparent.
- Sample size and method of sample selection are appropriate.
- Appropriate comparisons and analyses were performed.
- Data are presented in a manner that permits ready interpretation.
- Text agrees with figures and tables.

Interpretation, Discussion and Conclusion (as applicable)

- Interpretation is consistent with the data.
- Alternative interpretations are discussed.
- The significance of results and their relationship to the current knowledge is discussed.
- Conclusions are logical and supported by the data.
- Additional questions, solutions to problems and/or future directions are identified.

Format and Composition

- The content follows a logical sequence; concepts built on one another.
- Relevant literature is cited.
- The document is easy to read and grammatically correct.
- The document is free of typographical errors.
- Nonstandard abbreviations and jargon specific to the field are not used.

Please provide any written comments on the back of this sheet.