

**Procedures, Rules and Regulations**  
for  
**Graduate Students**  
**Effective Fall 2016**

The following is a review of various procedures and requirements for physics graduate students. It is subject to change and it does not supersede the catalog. Where there is disagreement between this and the catalog, the catalog applies. This description is meant to be helpful and indicative of practice rather than a legal description of rules. Another source of information is the *Graduate Student Handbook*.

## **REGISTRATION**

1. Professor Huennekens will be your academic advisor until you have a Ph.D. dissertation advisor. Registration questions or problems should be brought to him. He is responsible for monitoring your progress, though all faculty members are willing to give you advice. Professor Huennekens is also responsible for office assignments.
2. Professor DeLeo is responsible for TA assignments.
3. You must register two times each calendar year. Check the catalog for deadline dates.

## **GRADES**

As you are aware, graduate students are expected to perform at a higher grade level than undergraduates. Thus, a grade of C is considered poor performance for a graduate student. There is a "4-C rule" which states that a graduate student who receives MORE THAN four C's cannot continue to register. A grade of incomplete (N) must be removed within 12 months of the end of the semester of registration or all equity in the course is forfeited.

## M.S. PROGRAM

1. The following courses, unless an approved equivalent course has been taken previously, constitute the MS program.

|                           |                         |
|---------------------------|-------------------------|
| Phy 369 - Quantum I (3)   | Phy 420 - Mechanics (3) |
| Phy 424 - Quantum II (3)  | Phy 421 - E&M I (3)     |
| Phy 442 - Stat. Mech. (3) | Phy 422 - E&M II (3)    |
| Phy 428 - Math. Phys. (3) | Phy 491 - Research (3)  |

plus two additional courses selected from 300 and 400 level courses in Physics or related fields. These courses must be approved by the graduate advisor. A total of 30 credit hours are required for the M.S. degree.

2. **Phy 491 Research** is a project done under the supervision of a faculty member. A student typically carries out his or her project during the summer following the first year of graduate work. The following procedure will be used to match students with faculty interested in directing a research project:

Late in the fall semester, Professor Huennekens will distribute a list of available projects. By mid-February, students will submit an ordered list of choices of prospective faculty advisors to Professor Huennekens. The actual assignments will be made based upon the student's academic record, faculty input, and other criteria.

The commitment of a faculty member and a student to a Phy 491 project does not imply any further commitment by either party to a continuation of the research project beyond the summer.

3. An **MS-program form** and an **Application for Degree form** (obtained from Marina Long) must be completed at the beginning of the semester in which the degree is to be conferred. The MS-program form is to be signed by Prof. Huennekens, and then both forms should be taken to the Associate Dean for Research and Graduate Programs, College of Arts & Sciences for signatures, and finally brought to the Registrar's Office.

# Ph.D. PROGRAM

## a. Ph.D. QUALIFYING EXAMS

1. Qualifying exams will be scheduled at the start of the spring semester. All students entering with a bachelor's degree in physics are expected to take these exams after completing one and a half years of graduate work. Students entering with a master's degree in physics are expected to take the exams during their second semester of residence at Lehigh.
2. The exams presuppose course work through the first three semesters and consist of three separate exams. The material to be tested includes topics covered in core courses during the first three semesters of graduate study (Quantum I & II, Math Physics I, Classical Mechanics, E&M I & II, and Stat. Mech.) as well as additional material from these areas and other areas normally mastered by Ph.D. students at this level. Sample exams may be obtained from Marina Long, and questions can be directed to Prof. Huennekens, chairman of the qualifying exam committee.

The exams consist of three parts:

- a) Exam I:
    - i) General Knowledge, short answer questions – 1 hour
    - ii) Mathematical Physics – 1 hour
    - iii) Classical Mechanics – 1 hour
    - iv) Statistical Mechanics – 1 hour
  - b) Exam II:
    - i) Quantum Mechanics I – 1 hour
    - ii) Quantum Mechanics II – 1 hour
    - iii) E&M I – 1 hour
    - iv) E&M II – 1 hour
  - c) Oral exam - 1 thirty to sixty minute session
3. A student who does not pass the exam on the first attempt must retake the exam during the following June. The Ph.D. Qualifying Exams may be taken only twice. (*Except, see item 4 below.*)
  4. First-year graduate students are allowed to take a "free shot" at the written parts of the Qualifying Exam in January. If a student's score is sufficiently high he/she will also be invited to participate in the oral examinations. A first-year student who passes both written and oral exams will have completed the qualifying exam requirements and his/her progress towards the Ph.D. degree will be substantially accelerated. There is no penalty for not passing the "free shot."

## b. Ph.D. COURSE REQUIREMENTS

In addition to courses required for the Master's Degree, the following course requirements must be satisfied in order to successfully complete the Ph.D. program.

1. A total of **39** course credits (including the 30 course credits used for the MS program) is required for the Ph.D. degree. The other 9 credits beyond the Masters degree courses needed to reach the 39 credit total may include any 300 or 400 level physics courses except courses that are part of the undergraduate Physics and Astrophysics major cores (301, 302, 340 and 362), graduate research courses other than 491 (i.e. 490, 492 and 499), independent study courses, reading courses, seminar courses, and GAANN courses. 300 or 400 level courses outside the department can count towards the 39 credits if they have been approved by the graduate academic advisor or by the dissertation committee.
2. Phy 364 is required within the 39 credit total. (This requirement may only be waived for students who have obtained a B+ or better in a comparable advanced undergraduate or graduate course).
3. Breadth Requirement. At least 3 credits of 300 or 400 level advanced physics course work must be passed from each of at least two of the three categories shown in the table below. One-, two-, and three-credit special-topics lecture courses will be assigned to one of the three categories by the instructor in consultation with the department chair and associate chair. Exceptions to this rule may be approved by the dissertation committee. The breadth requirement is also included within the 39 credit total.

| <b>Category 1</b> (Astrophysics and Plasma Physics)  | <b>Category 2</b> (Optics, Solid State Physics and Atomic and Molecular Physics)   | <b>Category 3</b> (Fluids, Statistical Mechanics, Nonlinear Phenomena, and Biophysics)   |
|--|--|--|
| Phy 332 – High Energy Astrophysics<br>Phy 342 – Relativity and Cosmology<br>Phy 348 – Plasma Physics<br>Phy 395 – Advanced Stellar Astrophysics<br>Phy xxx – String Theory | Phy 352 – Modern Optics<br>Phy 355 – Lasers and Nonlinear Optics<br>Phy 363 – Physics of Solids<br>Phys 431 – Theory of Solids<br>Phy 446 – Atomic and Molecular Physics<br>Phy 482 – Applied Optics | Phy 443 – Nonequilibrium Statistical Mechanics<br>Phy 455 – Nonlinear Phenomena<br>Phy 471 – Continuum Mechanics<br>Phy xxx – Biophysics |

### **c. DISSERTATION ADVISOR**

Normally, soon after passing the qualifying examination, a student will begin the search for a suitable dissertation topic and a faculty advisor to direct his or her research project. This will be one of the most important steps you take in your career. The actual process is similar to that of a student seeking an advisor for his or her PHY-491 research project, except that the degree of commitment on the part of both student and professor is far more significant.

The faculty will try to keep students apprised of the activities and research projects that are available in the department, but it is the student's responsibility to acquire enough information to make a choice of dissertation project. You should talk to several professors, participate in group meetings held by some of the research groups, and consult with previous and current graduate students about their research experiences.

Although the faculty will do everything it can to provide assistance, it is each student's responsibility to identify his or her research advisor. However, individual faculty are not required to accept as dissertation students each and every student who requests to work with them, and a student/faculty collaboration on a Phy 491 research project is never a commitment by either party to a continued relationship. In addition, students who are making less than satisfactory progress may find it difficult or impossible to find a faculty member willing to direct their dissertation work.

Students are reminded that their achievements in graduate study at Lehigh can provide a substantial beginning for a very successful career in physics. Subsequent success in the job market will depend upon their accomplishments as measured relative to other young Ph.D.'s from quality programs.

### **d. DISSERTATION COMMITTEE**

The student must form a committee in consultation with his or her dissertation advisor. In the Physics Department, the committee normally consists of the advisor (who serves as chair of the committee), three additional physics faculty, and one professor from outside the department.

According to university rules, the minimum number of committee members is four. The committee chair must be a voting member of Lehigh's Department of Physics. At least two other committee members must also be voting Lehigh faculty members. With the written approval of the department, one of these two (but not the committee chair), may be drawn from categories that include departmentally approved adjuncts, emeritus faculty, professors of practice, university lecturers, and courtesy faculty appointees. Such a member must have a doctoral degree. The fourth required member must be from outside the student's department. With departmental approval, Ph.D. scientists from outside the university may serve as the outside member of the committee or even as dissertation advisor, but not as committee chair.

Committees may also include additional members who possess the requisite expertise and experience.

It should be noted that forming a committee with only four members or choosing committee members from outside the university can lead to difficulties in scheduling mandatory committee meetings, and that such scheduling difficulties are not an acceptable excuse for missed deadlines (see below). The department strongly recommends that each committee have a minimum of five members (the advisor plus three other physics faculty and one Lehigh faculty member from outside the department). If the advisor and student want to include a scientist from outside the university, we recommend that this individual be added as a sixth member of the committee. This committee makeup reduces the risk of being unable to assemble a legal committee for crucial meetings.

**e. Ph.D. DISSERTATION PROPOSAL** *DEADLINE* - Last class day of SPRING Semester of Year 3.

During the third year, the student will prepare a proposal for dissertation research, in consultation with his or her dissertation advisor, which will be presented in both written and oral formats to the dissertation committee. The student should prepare a list of all graduate courses taken and to be taken, including those taken at other institutions, and this should be attached to the proposal. A proposal signature sheet for the committee members should also be prepared. See the Appendix at the end of this document for templates for the signature sheet and proposal format. Once the student's dissertation advisor has approved the proposal, the written document is distributed to the committee and the oral presentation is scheduled. It is generally expected that committee members will receive the written document at least a week before the meeting.

The student's proposal for research must be signed by members of the student's committee following the oral presentation wherein the committee will assess the suitability of the project and the likelihood that the student will be able to successfully complete it.

In addition to approving the student's research plan, the committee may also require additional courses and language proficiency, as it deems appropriate.

Note that both the proposal and the General Exam (see Sec. f below) must be completed by the last day of class in the spring semester of year 3. Typically, the General Exam requires at least 2-3 weeks to prepare, and generally this occurs AFTER the proposal presentation. In addition, students are warned that it is often difficult to find meeting times that are acceptable to all committee members. "Scheduling difficulties" is not considered to be an acceptable excuse for missing the proposal or General Exam deadline. Thus 3<sup>rd</sup> year students are well advised to schedule their proposal meetings for January, February, and early March to allow plenty of time to also complete the General Exam by the end of the semester.

Note that if the proposal is not accepted by the committee at the first meeting, the student must schedule another committee meeting to present a revised proposal as soon as possible. Failure to present a proposal that is acceptable to the dissertation committee by the last day of class in the spring semester of year 3 results in the student being placed on departmental probation. If an acceptable proposal has not been presented to the committee and approved by the first day of class, fall semester year 4 (i.e. by the end of that summer) the student will lose his or her financial support, and will no longer be considered a student in good standing in the graduate program.

**f. GENERAL EXAM** *DEADLINE* - Last class day of SPRING Semester of Year 3.

The purpose of the General Exam is to determine whether or not the student is knowledgeable in his or her chosen area of specialization. The specifics of the General Exam will be determined by the student's dissertation committee on or about the time of their first meeting (Spring, year 3).

The General Exam will be administered by the dissertation committee in a meeting closed to the public. There is a special form for reporting the results of the General Exam (which can be found in the appendix of this document or can be obtained from Marina Long) and the student should bring a copy of this form to the exam. The student should complete all information at the top of the form before the exam. Once the committee members have indicated the results of the exam and signed the form, the completed form should be given to Marina Long in the Physics Department Office.

The General Exam will normally be completed within 1 – 1 ½ years after the student has passed the Ph.D. qualifying exam, and usually follows the admission to candidacy. The departmental deadline is the last day of class in the spring semester of Year 3. The College deadline is no later than seven months prior to the anticipated date of graduation.

If the student does not pass the examination at the first attempt, a re-exam must be scheduled as soon as possible. Failure to pass the General Exam by the last day of class in the spring semester of year 3 results in the student being placed on departmental probation. If the General Exam is not passed by the first day of class, fall semester year 4 (i.e. by the end of that summer) the student will lose his or her financial support, and will no longer be considered a student in good standing in the graduate program.

**g. Ph.D. CANDIDACY**

A student should file an APPLICATION FOR CANDIDACY no later than TWO YEARS after passing the qualifying exam, and preferably sooner. To apply for candidacy, the student must

submit a program of study to the Associate Dean for Research and Graduate Programs of the College of Arts & Sciences. The program of study consists of the following (also see the Appendix):

1. A formal application obtained from the office of the Associate Dean for Research and Graduate Programs of the College of Arts & Sciences. You will need SEVEN (7) copies of the proposal and the Ph.D. program, plus the completed application form. Each member of the committee must sign the first of the seven copies.
2. A list of all graduate courses taken and to be taken, including those taken at other institutions. A total of **39** course credits is required for the Ph.D. degree and the list of courses should satisfy the course requirements outlined in Sec. b.
3. Include a statement that the Qualifying Exam has been passed, and provide a list of committee members.

## **h. YEARLY DISSERTATION COMMITTEE MEETINGS AND FORMS**

*DEADLINE* - Last class day of SPRING Semester each year.

After the Proposal (see Sec. e) has been accepted and the General Exam (see Sec. f) has been passed, students must continue to hold annual dissertation committee meetings, starting in the Spring of year 4. The deadline for these meetings is the last class day of the Spring semester. Even if the student plans to have a dissertation defense in the summer, he or she must still convene a meeting of the dissertation committee during the academic year (i.e. a meeting **MUST** take place each year between the first day of class fall semester, and the last day of class spring semester – no exceptions!). A “Report on Ph.D. Dissertation Committee Meeting” form should be brought to the meeting (see Appendix).

## **i. Ph.D. DISSERTATION**

Research for the dissertation should be started as soon as possible. Typically, completion requires about two years of research plus a semester of writing the dissertation. There are, of course, significant variations. A **MAXIMUM** time limit is set by the university requirement that **ALL** post-baccalaureate work toward the doctorate must be completed within **TEN** years. Students are strongly discouraged from attempting to complete their dissertations in absentia. The completed dissertation must be written in accordance with style requirements established by the College of Arts & Sciences and must be submitted (in draft form) to the Associate Dean by the appropriate date (approximately six weeks before graduation; see the catalog for details).

After the dissertation has been revised and approved by the research advisor, copies of the dissertation should be distributed to the committee members and a **FINAL EXAMINATION** scheduled. **The committee should be allowed two weeks to read the dissertation and**

**provide comments.** The date of the exam must be sent in advance to the Associate Dean for Research and Graduate Programs, College of Arts & Sciences, Maginnes Hall.

## **j. FINAL EXAMINATION**

The **Dissertation Defense** will be administered by the Ph.D. committee. Other faculty and students in the university may be invited to attend the public presentation of the dissertation and may participate in questioning. After the public presentation and defense, the committee (with additional invited faculty) will examine the candidate's dissertation further and, by vote of the committee members, determine whether or not the candidate passes the dissertation defense.

**FINAL DOCTORAL EXAMINATION FORM** - In addition, the University requires that a special form called *Report on the Final Doctoral Examination* be completed at this time (this form can be found in the appendix of this document or can be obtained from Marina Long and should be brought to the defense by the student). The Dissertation Committee must sign this form and other faculty in attendance are invited to sign as well.

**DISSERTATION DEFENSE FORM** – In most cases, the committee members will have suggestions for corrections and revisions to the dissertation itself. A graduate student may spend anywhere from a few days to several weeks revising his or her dissertation after the dissertation defense. Once the committee members are satisfied with the final revisions to the dissertation, they must indicate their evaluation of the dissertation and must sign this form. (This is usually the front page of the dissertation.)

After the dissertation has been successfully defended and revised accordingly, the student must submit the final draft to the Associate Dean for Research and Graduate Programs for review by the Graduate Committee no later than TWO WEEKS before the degree is to be conferred.

Two unbound copies of the dissertation must be delivered to the Associate Dean for Research and Graduate Programs, College of Arts & Sciences. One of these must bear the original signatures of the Ph.D. committee members. The candidate must pay a microfilming fee and present a bursar's receipt for the payment.

Two additional unbound copies of the dissertation should also be delivered to John Huennekens to be sent for binding. One of the resulting hardcover copies will be archived in the Physics Reading Room while the other copy is for the student.

## **k. CLEARANCE**

Graduate students must receive clearance from the university prior to the awarding of a degree or prior to resignation from the university. The following obligations must be satisfied:

- All INCOMPLETE (N) grades must be removed.
- The dissertation must be cleared by the Associate Dean for Research and Graduate Programs, College of Arts & Sciences.
- All financial obligations must be cleared with the bursar, including: Tuition fees, library fines, bookstore charges, motor vehicle fines.
- All library books on loan must be returned.
- The Interdepartmental Clearance Sheet must be completed and signed by the department chairman and facilities services officer and submitted to the registrar at least THREE days prior to graduation.

# FINANCIAL SUPPORT

Once you have been accepted for graduate study in Physics at Lehigh, this department will do all it can to provide financial support in the manner of teaching and/or research assistantships and/or fellowships for the first five years you are in graduate school, provided of course that satisfactory progress is being made. Satisfactory progress will be measured by course grades, progress in your research project, and by your successful execution of the necessary duties required in the Ph.D. program. (e.g. Qualifying Exam, formation of a Ph.D. committee, proposal, General Exam, candidacy, dissertation defense.)

**Progress Review:** Each Spring the entire faculty will review the progress of all graduate students and determine whether or not satisfactory progress is being made. In addition, petitions for support for a sixth year are reviewed at this time.

**Renewal of TA Appointments:** Appointments of continuing students as teaching assistants is dependent upon satisfactory performance as a teaching assistant as well as satisfactory academic performance.

**Petitions for Extension of Support:** Students in their fifth year of graduate study at Lehigh who determine that they will not be able to complete the requirements for the Ph.D. within the expected five years will be required to submit to the faculty by April of their fifth year a petition for an extension of support for a sixth year. The form of this petition should be:

- A list of the items yet to be accomplished and the anticipated dates by which these will be completed.
- The endorsement of the student's Ph.D. committee of the feasibility of the plan to complete all requirements within the sixth year. (In order to obtain committee endorsement, the student must convene a formal meeting of the dissertation committee prior to the April faculty meeting.)
- Optionally, the petition may also contain an explanation of extenuating circumstances that may have been a cause of impeded progress towards the degree.

Support beyond the sixth year will not be available except in very extreme situations.

## SUMMARY OF SCHEDULE and DEADLINES

| Item  | Schedule/Deadlines   |
|---|--|
| Ph.D. Qualifying Exam                         | 1 <sup>st</sup> try: January, Year 2<br>2 <sup>nd</sup> try: June, Year 2*                               |
| Proposal and First Ph.D. Committee Meeting    | Deadline: Last day of spring classes, Year 3*  |
| Admission to Candidacy                        | Normally just after the 1 <sup>st</sup> committee meeting. Deadline: Last day of spring classes, Year 3* |
| General Exam                                  | Deadline: Last day of spring classes, Year 3*  |
| YEARLY Committee Meetings                     | Once per year, beginning Spring, Year 4*   |
| YEARLY progress evaluation by physics faculty | April, following last day of class   |
| Limit of support                              | Five years*  |

Failure to meet any of the above deadlines marked by an asterisk will result in loss of the registration privilege for the next registration period and/or forfeiture of support until the problem is corrected. Students not registered will not receive any form of financial aid and upon late registration will have to pay a late registration fee to the University. Students unable to meet deadlines for truly extenuating reasons may, of course, petition the faculty for a waiver of the rule.

## **APPENDIX**

### **DISSERTATION COMMITTEE MEETINGS AND FORMS**

The following pages contain a summary of dissertation committee meeting requirements, necessary forms, and templates for forms constructed by the student.

## Dissertation Committee Meeting Requirements

Before each meeting of your Ph.D. dissertation, you should see Marina to obtain the necessary forms (or templates of forms you must create yourself) for your meeting. After each meeting, you will need to submit the completed forms and documents to Marina. She will make copies of them for the department and send the originals to the Office of the Associate Dean for Research and Graduate Programs of the College of Arts & Sciences.

- 1) **Proposal:** Your first committee meeting is generally the one where you present your dissertation proposal. Marina has a template (also included on the following page) to show you the format of the proposal, which must include a title page, signature sheet, comments/suggestions/requirements sheet, grade sheet, and the proposal itself. After you successfully present your proposal to your dissertation committee, you should submit the original packet of documents to Marina. Once you have completed the Proposal, you should officially “**Apply for Candidacy.**” The appropriate form should be downloaded from the College of Arts and Sciences Graduate Programs website and completed electronically. Note, if you plan to have your General Exam within a few weeks of the Proposal, you may want to wait until after the General Exam to apply for candidacy.
- 2) **General Exam:** Your second committee meeting is usually held soon after your proposal meeting and corresponds to your General Exam. Your advisor and dissertation committee will let you know (usually at or soon after your proposal meeting) what is the format and what is required for your General Exam. Before your meeting where you present your General Exam, you should obtain a “Report on the General Doctoral Examination” form from Marina. Fill out the form (except for the signatures of course) before the meeting and bring it to the meeting. After successfully passing the General Exam, you should submit the signed form to Marina.
- 3) **Annual Dissertation Committee Meetings:** After your Proposal and General Exam meetings, you are required to have at least one meeting of your dissertation committee each academic year (between the first day of class, Fall semester, and the last day of class, Spring semester). Before each meeting, you should obtain a copy of the form “Report on Ph.D. Dissertation Committee Meeting.” A copy is provided in this Appendix. After the meeting, the signed form should be submitted to Marina.
- 4) **Final Examination:** For your final thesis defense, you should bring two forms. The first is the “Report on the Doctoral Dissertation Examination,” which can be obtained from Marina. The second is signature sheet indicating approval of the dissertation itself by your committee. You must make up this signature sheet yourself, but Marina can provide you with a template. A copy is also provided in this Appendix. After you have successfully defended your dissertation and have obtained approval for the final draft, you should submit *copies* of these two forms to Marina. The originals should be submitted with your dissertation to the Graduate Programs Office of the College of Arts and Sciences.

## Ph.D. Proposal Template

The Ph.D. thesis proposal should consist of the following items:

- 1) Title page: should include title of proposal, student's name, and date. See following page for suggested format. (Note: you are free to modify the suggested formats as long as you provide the same information.)
- 2) Signature page: See following for suggested format. Note that a legal dissertation committee must consist of a minimum number of four members. Three of these, including the committee chair, must be voting faculty members in the Department of Physics (one of the three, but not the committee chair, may be a departmentally approved adjunct faculty member, lecturer, or research scientist). The fourth committee member must be from outside the Physics Department (either from another Lehigh department or from outside the university). Additional committee members (beyond the required four) can also be included and are generally a good idea. In the Physics Department, the typical dissertation committee consists of four Physics faculty and one faculty member from another Lehigh department. This composition allows you to still have a legal committee if, for example, one member of the committee is unable to complete his or her service on the committee. You should also try to avoid selecting committee members who have to travel long distances to attend annual committee meetings. Committee members need to be informed that service on the committee generally requires attendance at on-campus meetings at least once per year for ~ 3-4 years.
- 3) Comments/Suggestions/Requirements page: See following for suggested format.
- 4) Program of study for the Ph.D.: should include courses taken and future coursework. See following for suggested format. Note that program of study should add up to 72 credits (including dissertation credits).
- 5) Narrative: should include description of proposed work, proposed timeline, and references.

# Experimental Studies of XXX

by

John J. Smith

*Graduate Research Proposal*

*Presented to the Graduate and Research Committee  
of Lehigh University*

*in Application for Candidacy for the Degree of  
Doctor of Philosophy  
in Physics*

Lehigh University

January 2016

Approved and recommended for acceptance as a proposal in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Physics

\_\_\_\_\_  
Date

Committee Members:

\_\_\_\_\_  
John Huennekens, Committee Chair

\_\_\_\_\_  
Sera Cremonini

\_\_\_\_\_  
Volkmar Dierolf

\_\_\_\_\_  
Ivan Biaggio

\_\_\_\_\_  
James Roberts

**Comments/Suggestions/Requirements**  
(please continue on additional sheets if necessary)

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John Huennekens, Committee Chair

Program for Ph.D. – John J. Smith  
Department of Physics, Lehigh University

- B. S. Physics: XYZ University, May 2013
- M. S. Physics: Lehigh University, January 2015
- Qualifying Exam: Passed, January 2015

| <u>Courses taken at Lehigh University</u> | <u>Credits</u> | <u>Grade</u> |
|---|----------------|--------------|
| PHY 362 – Atomic and Molecular Structure  | 3              | A            |
| PHY 420 – Mechanics                       | 3              | B+           |
| PHY 428 – Methods of Math Physics         | 3              | B-           |
| PHY 369 – Quantum Mechanics I             | 3              | C+           |
| PHY 421 – Electricity and Magnetism I     | 3              | A-           |
| PHY 442 – Statistical Mechanics           | 3              | A            |
| PHY 491 – Research                        | 3              | B+           |
| PHY 422 – Electricity and Magnetism II    | 3              | B            |
| PHY 424 – Quantum Mechanics II            | 3              | A            |
| PHY 352 – Modern Optics                   | 3              | A-           |
| PHY 363 – Physics of Solids               | 3              | B-           |
| etc.                                      |                |              |

Current courses

|                                    |   |
|------------------------------------|---|
| PHY 332 – High Energy Astrophysics | 3 |
| PHY 499 – Dissertation             | 6 |

Future coursework

|                                       |    |
|---------------------------------------|----|
| PHY 355 – Lasers and nonlinear optics | 3  |
| PHY 499 – Dissertation                | 27 |

# LEHIGH

## University

*College of Arts & Sciences  
Research and Graduate Programs Office  
280 Maginnes Hall  
(610) 758-84280*

### Report on the General Doctoral Examination

of \_\_\_\_\_, Major \_\_\_\_\_ Minor(s) \_\_\_\_\_  
Date of Examination \_\_\_\_\_ Place of Examination \_\_\_\_\_  
Examining Committee: Professors \_\_\_\_\_

\_\_\_\_\_ appeared before us this day for the general examination.  
As the examining committee we hereby report our individual votes on the result of the examination.

#### Voting "Passed"

| Signatures | Remarks |
|------------|---------|
| _____      | _____   |
| _____      | _____   |
| _____      | _____   |
| _____      | _____   |
| _____      | _____   |
| _____      | _____   |
| _____      | _____   |

#### Voting "Not Passed"

| Signatures | Remarks |
|------------|---------|
| _____      | _____   |
| _____      | _____   |
| _____      | _____   |
| _____      | _____   |
| _____      | _____   |
| _____      | _____   |
| _____      | _____   |

## Report on Ph.D. Dissertation Committee Meeting

Student's Name \_\_\_\_\_

Date of Committee Meeting \_\_\_\_\_

Committee Members Present \_\_\_\_\_ (Committee Chair)  
(please sign)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Recommendation of the Committee

Committee meeting passed

Committee meeting failed

Next Committee meeting should be scheduled for (date) \_\_\_\_\_

Comments, Recommendations, and Suggestions (please continue on additional sheets if necessary):

## **Ph.D. Dissertation Signature Sheet Template**

The following page contains a suggested format for the dissertation signature sheet. Create a similar signature sheet for your dissertation committee and bring it to your thesis defense along with the Ph.D. final examination form (already filled-in by you except for the signatures).

Approved and recommended for acceptance as a dissertation in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Physics

\_\_\_\_\_  
Date

Committee Members:

\_\_\_\_\_  
John Huennekens, Committee Chair

\_\_\_\_\_  
Sera Cremonini

\_\_\_\_\_  
Volkmar Dierolf

\_\_\_\_\_  
Ivan Biaggio

\_\_\_\_\_  
James Roberts

# LEHIGH

## University

*College of Arts & Sciences  
Research & Graduate Programs Office  
280 Maginnes Hall  
(610) 758-4280*

### Report on the Doctoral Dissertation Examination

of \_\_\_\_\_, Major \_\_\_\_\_ Minor(s) \_\_\_\_\_

Date of Examination \_\_\_\_\_ Place of Examination \_\_\_\_\_

Examining Committee: Professors \_\_\_\_\_

\_\_\_\_\_ appeared before us this day for the Doctoral Dissertation examination. As the examining committee we hereby report our individual votes on the result of the examination.

#### Voting "Passed"

Signatures

Remarks

|       |       |
|-------|-------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

#### Voting "Not Passed"

Signatures

Remarks

|       |       |
|-------|-------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |