



## **GRADUATE PROGRAM IN BIOPHYSICAL SCIENCES HANDBOOK**

The Graduate Program in Biophysical Sciences grants a Ph.D. degree from both the Biological and Physical Science Divisions, serving the needs of students who have strong backgrounds in the Physical Sciences and are interested in research at the interface of the physical, biological and computational sciences.

### **Executive Committee**

Program Director – Tobin Sosnick  
Program co-Director – Greg Engel  
Curriculum Director – Adam Hammond  
Graduate Program Administrator – Michele Wittels  
Executive Administrator – Candice Lewis

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# **PROGRAM OF STUDY**

## **1. THE FIRST YEAR**

### **1A. Required Curriculum**

The required curriculum is intended to be accomplished in the first year of the program. This curriculum includes the Biophysical Research Immersion (BRI) course, biological sciences selectives, physical sciences selectives, a course in molecular biophysics, and the division-wide ethics course, “Scientific Integrity and Ethical Conduct of Research.”

#### **1A1. The Biophysical Research Immersion (BRI)**

The BRI is an extensive practical course in collaborative research methods and professional skills. The course typically begins 6 weeks before the beginning of Autumn Quarter and meets for 50 hours per week for four weeks, and then meets for 25 hours per week through the Autumn and Winter Quarters, ending with a trip to the Biophysical Society Annual Meeting.

#### **1A2. Application Writing and the NSF GRFP**

Eligible students should not miss the opportunity to apply for the National Science Foundation Graduate Research Fellowship Program (GRFP). This prestigious fellowship can be applied for in either your first or second year. Many students should wait until their second year, so that they have chosen an advisor and can apply on the basis of their thesis project. However, some students should consider applying in their first year. There are several other opportunities, including fellowships from the DOE, the DOD, private foundations, and the F31 grants from some institutes at the NIH. As part of the Lab Course, students will work on writing a draft of the larger of the two essays from the application: the Personal, Relevant Background and Future Goals Statement, or a section from an applicable fellowship application.

#### **1A3. Lecture Course Requirement: “The 3+3 Curriculum”**

Six graduate courses are required: three in the biological sciences and three in the physical sciences. These courses must be 100 unit didactic courses. Reading courses and Seminars will not fulfill this requirement, nor will method-specific workshops. Two courses shall be taken in each of the Autumn, Winter and Spring quarters.

The Lecture Course Requirement must be completed within the first year, unless a petition to delay the requirement is granted (See 3M. Program Petitions). Petitions to delay one course from the Spring Quarter can be granted by the Curriculum Director. Other petitions regarding course requirements, including delaying an Autumn or Winter course or attempting to complete three courses in one quarter, will be reviewed by the full Executive Committee. (See 3M. Program Petitions).

All courses fulfilling the Lecture Course Requirement must be taken for quality grades (standard letter grades).

Students are encouraged to take additional courses beyond this requirement if it furthers their research goals. Students often take such courses in their second year and beyond.

In each set of three required courses, two of the courses must be chosen from the BioSci and PhySci lists below (or fulfill the spirit of the requirement). One of the two remaining courses must be a course in molecular biophysics (1A3c). The final course is a largely unrestricted elective that rounds out the 3 & 3 requirement. For example, if the molecular biophysics course is designed for (and taken by) students in biology, then the final elective must be a physical sciences course.

*The Biophysical Sciences Program welcomes petitions from students who wish to take courses that are not listed but fulfill the spirit of the requirements. See section 3M for information about petitions. Students considering a course petition should ask the Curriculum Director (Adam Hammond) for guidance and advice.*

Lecture Course Requirement: "The 3+3 Curriculum"			
→ 2 courses from the BioSci list	An elective in the biological sciences	2 courses from the PhySci list	A molecular biophysics course from the Physical Sciences
→ 2 courses from the BioSci list	A molecular biophysics course from the biological sciences	2 courses from the PhySci list	An elective in the physical sciences

### **1A3a. Biological Sciences Course Requirements (2 courses)**

*Two courses from the BioSci list:*

Cell Biology I\* (MGCB 31600)  
 Cell Biology II (MGCB 31700)  
 Molecular Biology I (MGCB 31200)  
 Molecular Biology II (MGCB 31300)  
 Fundamentals of Cancer Biology (CABI 30800)  
 Fundamentals of Bacterial Physiology (MICR 30600)  
 Host Pathogen Interactions (IMMU 31200)  
 Cellular Neurobiology (NURB 31800)  
 Genetic Analysis of Model Organisms (MGCB 31400)  
 Developmental Mechanisms (DVBI 36400)  
 Human Genetics (HGEN 47000)

Chemical Biology II (CHEM 33300) Note: *Chem Bio I is on the PhySci list*

Community Ecology (ECEV 42600)

Principles of Population Genetics (GENE 35600)

\* This excellent course is the recommended Autumn course for all students.

Note: These courses represent introductory graduate biology training and are intended to provide exposure to fundamental biological concepts. The courses are from the more descriptive fields of biology, and cannot be replaced with other computational or more physically-oriented courses, even when such courses are taught by the same departments. Students can petition (see section 3M) if they believe a course not on the list above should count toward this requirement. Students should discuss their intent to petition with the Curriculum Director prior to the start of the quarter. Petitions will be evaluated based on the course and the background and needs of the individual student.

*Plus, one additional biological sciences course.* This course may either be used to fulfill the Molecular Biophysics requirement (1Ac3), or can be an elective in any area of biology. **Reading courses and workshops do not fulfill this requirement.**

### **1A3b. Physical Sciences Course Requirements (3 courses)**

*Two courses from the PhySci list:*

#### Chemistry

Statistical Thermodynamics (CHEM 36300)

Wave Mechanics / Spectroscopy (CHEM 36100)

Advanced Statistical Mechanics (CHEM 36400)

Chemical Dynamics (CHEM 36500)

Organic Synthesis / Structure (CHEM 32200)

Chemical Biology I (CHEM 33200) Note: *Chem Bio II is on the BioSci list*

Bioinorganic Chemistry (CHEM 30900)

Physical Organic Chemistry (CHEM 32100)

#### Physics

Graduate Quantum Mechanics (PHYS 34100)

Math Methods of Physics (PHYS 33000)

Advanced Electrodynamics (PHYS 32200)

Statistical Mechanics (PHYS 35200)

Topics in Fluid Mechanics (PHYS 42600)

Soft Condensed Matter (PHYS 36700)

#### Computer Science

Machine Learning (CMSC 35400)

Algorithms (CMSC 37000)

Discrete Mathematics (CMSC 37110)

#### Math and Statistics

Analysis I: Real Analysis (MATH 31200)

Introduction to Stochastic Processes (STAT 31200)

Multivariate Statistical Analysis (STAT 32950)

Machine Learning and Larger Scale Data Analysis (STAT 37601)

Fundamentals of Computational Biology (STAT 35450)

#### Molecular Engineering

Applied Numerical Methods (MENG 33100)

Thermodynamics and Statistical Mechanics (MENG 33000)

#### Geophysical Sciences

Global Biogeochemical Cycles (GEOS 33800)

Note: The courses listed often represent introductory sequences in the quantitative or computational areas of the traditional fields of the physical sciences. Subsequent courses in these sequences will also likely meet this requirement (except Chem Bio II which is counted as a biological sciences course). These courses cannot be replaced with courses that are more biologically oriented even when such courses are offered by the same departments. Students can petition (see section 3M) if they believe a course not on the list above should count toward this requirement. Students should discuss their intent to petition with the Curriculum Director prior to the start of the quarter. Petitions will be evaluated based on the course and the background and needs of the individual student.

*Plus, one additional course in the physical sciences.* This course may either be used to fulfill the molecular biophysics requirement (1A3c) or can be an elective in any area of the physical sciences. **Reading courses and workshops do not fulfill this requirement.**

#### **1A3c. Molecular Biophysics Course Requirement**

One of the two elective courses must be from this list of *molecular biophysics* courses. Some of these courses are not offered every year.

- 1) Biophysics of Biomolecules\* (BPHS 31000)
- 2) Simulation, Modeling, and Computation in Biophysics (BCMB 31358)
- 3) Biophysics of Membrane Proteins (BCMC 32300)
- 4) Biophysical Chemistry\* (CHEM 38700)

\* These two courses have very similar content, and thus, they can't both be taken for credit.

Note: The intent of this list is to provide exposure to fundamental concepts of biophysics. Several of these courses have been cross-listed in more than one

department. Thus, they can serve as the elective for either the BioSci or the PhySci requirement. Students should consider their other elective choice when deciding which molecular biophysics course to take.

#### **1A4. Responsible Conduct of Research (RCR)**

Federal guidelines require training in RCR at least every four years throughout an academic career. In the Spring Quarter of the first year, students must take *BSDG 55000 "Scientific Integrity and the Ethical Conduct of Research"*. An advanced course in Scientific Ethics (BPHS 33000) is provided specifically for BPHS students every other year (See section 3C). Students must take this course in their fourth or fifth year.

#### **1A5: Dropping/Adding Courses**

Students may drop/add courses per University guidelines but are strongly encouraged to discuss such decisions with the Curriculum Director prior to changing their courses. Please note that the program is not notified when courses are dropped/added and that it remains the student's responsibility to ensure that his/her schedule fulfills the Lecture Course Requirement.

### **1B. Selection of Thesis Advisors**

Upon their arrival and throughout the first year, students have opportunities to meet and learn about potential mentors. Laboratory rotations are the primary mechanism for students to thoroughly investigate possible mentors. Ultimately, finding the thesis advisors is the responsibility of the student, and students are required to find advisors before the July 31 deadline in order to remain in Good Standing in the program.

*The BPHYS Rotation Form*, which describes expectations for laboratory rotations and dual mentorship in detail, should be distributed by the student to the potential advisor in advance of the rotation. The first page must be completed by the advisor together with the student and returned to the Program Administrator at the beginning of the rotation. The second page should be completed by the advisor at the end of the rotation and returned to the Administrator. A Rotation Form must be turned in to the Program Administrator by the first day of each rotation period.

Appendix B shows the default rotation plan. This plan has been designed to be effective for most students. The plan can be modified to suit individual needs by submitting a proposed alternate plan to the Curriculum Director for approval. Significant changes require a petition (see below for more details regarding petitions for altered rotation format).

*Official Mentor Selection*, Students may, at any point, formally join their two chosen groups and begin their thesis work. It is not required that students complete the full rotation schedule. Once dual mentors have been selected, the student must request that both mentors complete the Student Funding Plan Form. The Form details mentors' financial responsibilities to the student. If students or mentors have questions regarding the Form they should contact the Program administrator; once completed the student is responsible for submitting the completed Form to the Program administrator. The Student Funding Plan Form is due two weeks after the end of each student's final rotation. This is a firm deadline, if the form has not been submitted by the deadline, the student must submit a new rotation form (often including a petition to extend the rotation schedule) to remain in Good Standing.

It is strongly expected that advisor selection will be complete by the end of July of the first year. This is a critical mark of student progress in the program.

*Students may alter the standard rotation format with permission of the curriculum director,* The complexity of mentor searches and the breadth of the involved faculty can make such changes necessary and appropriate. For example, if one of the faculty members from the first rotation has agreed to become a thesis mentor, the structure of the second rotation may need to be altered.

### **1C. Thesis Committee Formation**

Students at the beginning of their second year, with the help of their thesis advisors, will assemble a thesis committee consisting of at least four faculty members with research interests related to the subject of the thesis research. The thesis committee will be chaired by a committee member who is not a thesis advisor. This chair communicates committee decisions, such as the outcome of the qualifying exam, assessment of student progress at annual committee meetings, and the outcome of the thesis defense, to the Program. The chair may also serve as an important source of advice in situations where committee members disagree.

Students must submit the proposed thesis committee to the Program Administrator for approval by the Graduate Training Oversight Committee. The thesis committee is usually, but not necessarily, the same as the examination committee (Section 2A.) See Appendix A for detailed description of dissertation completion procedures and requirements that serve as a guide to the thesis committee.

## **2. ACADEMIC ADVANCEMENT**

This section contains the primary requirements for advancement through the program from the qualifying exam to the thesis defense.

### **2A. BPHYS QUALIFYING EXAMINATION**

A qualifying examination is required to be admitted for Ph.D. candidacy and is administered during Autumn Quarter of a student's second year. The exam consists of a written research proposal of a thesis project and an oral defense of this proposal. *All oral examinations must be completed by the Reading Period of Autumn quarter.* Failure to complete the exam will result in a failing grade unless special dispensation has been granted by the program. Examination outcomes are announced during Finals Week of Autumn quarter.

#### **2A1. Examination Committee**

Each qualifying examination is administered by an examination committee comprised of four faculty members. Each student is responsible for proposing their own Examination Committee consisting of four members by the second week in Autumn Quarter, with final approval by the Graduate Training Oversight Committee. In most cases, the examination committee will later become a student's thesis committee. In addition, the committee must elect one of the committee members as its chair. The chair must be UChicago faculty. Neither thesis advisor may be elected as chair. At a minimum, the thesis committee must consist of three tenured track University of Chicago faculty members.

## **2A2. Written Proposal**

The proposal must follow the same format as the Research Training Plan from a Ruth L. Kirschstein National Research Service Award for Individual Predoctoral Fellows (F31) grant application. This is a standard NIH research grant format.

Details of the format for the written proposal can be found on the NIH website. The general outline for the proposal requires identifying 2-3 hypothesis-driven aims for your research project. Page limits are as follows:

Specific Aims (1 page)

Research Strategy (6 pages)

The proposal should be the student's thesis research project. It is expected that the Thesis advisors will be involved in the development of the ideas and will provide mentoring on the proper scope and style of a grant application. It is the responsibility of the student to seek out this guidance. As the author of the proposal, the student is solely responsible for developing a scholarly understanding of the science laid out in the proposal, including the relevant literature, the experimental details, and the broader implications.

It is strongly advised that students arrange a joint meeting with both advisors at least 4 weeks prior to the examination. The purpose of this meeting is to discuss and agree upon collaborative aspects of the proposal. The student should plan to give a final draft of the proposal to each advisor 2 weeks before the examination.

## **2A3. Proposal Distribution Deadline**

Each student's completed proposal must be handed out by the student to all members of the examination committee and the Graduate Program Administrator one week prior to their oral defense by 5:00pm. This is a hard deadline. If the proposal has not been distributed by then the student will fail the exam and a second (and final) attempt may be scheduled.

In general, the program views proposal distribution deadline extension requests with disfavor; however, if unavoidable circumstances prevent the student from meeting this deadline the following extension protocol may be requested:

Extensions are granted by petition only. The petition must come from the student and must be addressed to the Executive Committee. The petition must be co-signed by all thesis committee members (email concurrence is acceptable) and the petition must be ratified by Executive Committee.

The permission for extension must be granted and the Graduate Program Administrator notified by the new distribution deadline or a failing grade will be recorded.

## **2A4. Oral Defense and Examination**

The goal of the oral examination is to evaluate the student's preparation and capacity to conduct the proposed research and the student's depth of knowledge in relevant scientific fields. Although the examination will focus on the research proposal, questions may include subjects covered in the first year curriculum, particularly in related areas. During the oral examination the thesis advisors will fully participate in discussions but should avoid directly assisting the student in answering questions from the committee.



The examination committee will determine the format of the oral examination. It is the student's responsibility to understand and meet the expectations of their examination committee. Generally, the student prepares a 30- 45 minute presentation describing the proposed research, although questions from the committee typically lengthen the exam to two hours. Students should practice this presentation with their labs, peers and advisors before the examination. Students are encouraged to discuss their research proposal and the nature of the oral examination with the examination committee members in advance.

Both before and after the examination, the student will be asked to leave the room for committee discussions. After the final discussion, the committee will go over their recommendations with the student.

## **2A5. Qualifying Examination Outcome**

The Graduate Training Oversight Committee assigns to each student one of four broad results on the basis of the recommendation of the examination committee:

- 1) Passed Unconditionally - Qualifying exam requirement for advancement to candidacy fulfilled.
- 2) Passed Conditionally - Advancement to candidacy is dependent on satisfactory completion of specified requirements, but a 2<sup>nd</sup> oral examination is not necessary. (This outcome may only be used for the first examination attempt)
- 3) Failed Conditionally - A 2<sup>nd</sup> oral examination will be required, after the completion of specified preparations. (This outcome may only be used for the first examination attempt)
- 4) Failed - Potentially requiring new thesis advisors or dismissal from the Program.

Conditions for passing may include revisions of the written proposal, subject papers, additional coursework, or any other academic activity. A third attempt of the oral examination is not permitted.

## **2B. Thesis Committee Meetings**

Every student must assemble a thesis committee (See section 1C) before the start of their second year. Thesis committee meetings should be scheduled by the student every 9-12 months to report progress and receive guidance. The student must send the committee a summary of progress since the last meeting at least 24 hours before each meeting. The content of this summary should be discussed with the advisors and conform to committee expectations which should be determined at the first committee meeting after the qualifying examination. *It is required that the Program Administrator be informed of the meeting date, time and place at least two days beforehand, as it is necessary to distribute materials to committee members prior to the meeting.* The thesis committee chair must apprise the student of the view of the thesis committee following each meeting, and submit a written report delineating committee recommendations to the Graduate Program Administrator.

### **2B1. Delaying a Thesis Committee Meeting.**

With concurrence from all thesis committee members, it is possible to delay the next committee meeting. The committee chair must email the Graduate Program Administrator to report the agreed upon delay.

## **2C. Dissertation and Requirements for PhD Degree**

Once an appropriate body of work has been completed on the thesis research project, the student should schedule a thesis committee meeting (penultimate meeting) to request permission to write and defend his or her dissertation. If the thesis committee decides that the student is ready to write and defend the thesis, the chair of the thesis committee must report this to the Graduate Program Administrator.

Dissertations must comply with the specifications set by ProQuest/UMI, by the Library, and by the University. The Dissertation Office in the Regenstein Library provides a detailed description of these requirements, and also for deadlines for submission of the dissertation at <http://www.lib.uchicago.edu/e/phd/>. The Dissertation office offers quarterly training on dissertation preparation; in addition there is an optional draft review service that is offered for the first few weeks of each quarter. Draft review will help you verify that you are preparing your dissertation in accordance with formatting guidelines, and will help streamline final approval after your defense.

Students must submit complete copies of their thesis to thesis committee members at least two weeks prior to the date of their examination. The examination consists of a public seminar followed by a closed session involving only the student and members of the thesis committee. There are three potential outcomes: unconditional pass, pass with certain provisions, and fail. Provisions may include corrections or changes to the written work and/or a second examination.

Once final approval has been granted, the dissertation is uploaded according to Dissertation Office procedure. Once a dissertation has been accepted, the student is required to complete the Survey of Earned Doctorates in order to graduate.

## **3. REQUIREMENTS AND POLICIES**

### **3A. Admission to Candidacy**

To be admitted to candidacy, students must 1) pass the qualifying exam, 2) complete all course requirements while maintaining a 3.0 GPA (see 1A1e for computing the GPA) 3) complete the first Ethics training course 4) be in Good Standing. Advanced students who have not yet met the requirements for candidacy may be asked to submit an explanation of the delay. Students may be considered for candidacy at any time after they have completed the requirements. Once a BPHYS student has been admitted to candidacy that student is eligible to have a Master of Science degree in Biophysical Sciences conferred (jointly) by the Deans of the Biological and Physical Sciences Divisions.

### **3B. Teaching Experience Requirement**

Students are required to serve two quarters as teaching assistants. Students may not TA until after they pass their qualifying examination. Students may serve as teaching assistants for the Biophysical Sciences Lab Course (BPHS 35001, 35002). Numerous other opportunities exist at the University to fulfill this requirement. One quarter requirement may be satisfied by taking the BSD TA Training Course, BSDG 50006, which is typically offered in the Autumn Quarter.

### **3C. Ethics II Course**

Both the National Science Foundation and the National Institutes of Health require that funded scientists regularly participate in training in the responsible conduct of research. The Biophysical Sciences program offers an advanced course in research ethics every other year. All students are required to take this course in their fourth or fifth year. Students graduating in the quarter in which the course is offered are not required to take the course. This course meets the current requirements of both national funding agencies, and will be updated as these requirements evolve.

### **3D. Individual Development Plan (IDP)**

Individual Development Plans are required by the BSD and by the NIH. IDPs are tools to help students determine career paths and choices that best suit their goals and interests. Details regarding this requirement are available from the Program Administrator.

### **3E. Term of Predoctoral Research Training**

Students who have not scheduled their penultimate thesis committee meeting by the Winter Quarter of the fifth year must have a progress review overseen by the Executive Committee. Tuition support is available through six years of residence, after which each student may be responsible for the cost of tuition.

### **3F. Academic Probation and Good Standing**

Students who adhere to program policies and fulfill program requirements are considered to be in Good Standing. Students are expected to maintain good academic standing throughout their graduate career. Program directors may impose restrictions or take other actions (including placing a student on Academic Probation) if a student fails to remain in Good Standing. If Academic Probation is not resolved after two quarters (6 months), the student may face expulsion from the program. Some examples of how Good Standing will be judged are enumerated below in 3F1-3F6.

#### **3F1 Course Completion**

During the first and second year, academic standing will be judged primarily by timely completion of coursework with quality grades. The Lecture Course Requirement (3+3 Curriculum) described in section A3 should be completed within the first year. Circumstances that result in fewer than five of the six courses being completed with quality grades in the first year require approval by the Executive Committee to maintain Good Standing.

#### **3F2 Laboratory Course**

Full participation and satisfactory performance in the Laboratory Course is required.

#### **3F3 GPA**

To remain in good standing, students must maintain a 3.0 grade point average in lecture courses at all times. Grades in the Lab Course are not used to compute the GPA. (GPA is calculated using plusses and minuses, numerical equivalents are as listed below)

A = 4.0

A- = 3.66

B+ = 3.33

B = 3.0

B- = 2.66

Any student whose GPA falls below a 3.0 will automatically be placed on Academic Probation. A student who has a GPA below 3.0 at the time of their qualifying exam can achieve, at most, a provisional pass.

Any “C” is an unacceptable grade. If a student receives a “C” or below in a course:

- 1) The Curriculum Director will contact the instructor to get further details about the student’s performance.
- 2) The student will meet with the Program Director to discuss the issue.
- 3) Further action or requirements may be established by the Director.

### **3F4 Group joining**

Students must identify advisers and join research groups as laid out in Section 1C. Failure to join research groups will result in a student being placed on academic probation.

### **3F5 Qualifying exam**

Students who fail their first qualifying exam for any reason will be placed on academic probation (See Section 2.)

### **3F6 Research requirement**

After the qualifying exam and coursework are complete, the primary activity of the student will be research. The thesis committee will determine the requirements and standing of the student, but in no case shall a student be dismissed without being placed on probation for at least six (6) months.

### **3F7 Academic or research misconduct**

Academic or research misconduct (as defined by the University) may result in immediate loss of good standing and possible termination at the discretion of the Executive Committee or other university disciplinary committee.

## **3G. Residence Requirement**

Ph.D. programs in the sciences require full 4-quarter enrollment. Time off during interim periods is counted as vacation. The distribution of vacation time is to be determined by the student and their mentors. If circumstances require a more extended absence, the student must arrange for a leave of absence per university policy or by petition. See section 3M for petition procedure.

## **3H. Disability Accommodations**

The program is eager to assist those who need accommodations for disabilities. The first step in arranging such an accommodation is to review the procedures at <http://disabilities.uchicago.edu/>. The Program Administrator and Dean of Students are available to discuss policies and procedures if further information is required.

The University of Chicago is committed to complying with Section 504 of the Rehabilitation Act (Section 504) and the Americans with Disabilities Act (ADA). Student Disability Services

works to support and to provide accommodations for students with a wide range of physical, learning and psychological disabilities.

### **3I. Sexual Harassment Policy**

The University of Chicago's Policy on Harassment, Discrimination, and Sexual Misconduct is described here:

<http://studentmanual.uchicago.edu/page/policy-unlawful-discrimination-sexual-misconduct>

The policy applies to students and other program participants, staff, postdoctoral researchers, faculty, and other academic appointees, volunteers, as well as to anyone on whom the University has formally conferred a title, regardless of employment status.

### **3J. Family Leave Policy**

The program adheres to all University policies regarding Family Leave. The University of Chicago's Policy on Family Leave is described here:

<https://studentmanual.uchicago.edu/parents>

### **3K. Terminal Master of Science Degree Policy**

Students in the Program in Biophysical Sciences are admitted directly for study toward the Ph.D. degree. Students who leave the program prior to completing the requirements for the Ph.D. may be awarded an MS degree. This requires completing the curriculum and receiving a passing grade on the qualifying examination. The program may impose additional requirements before recommending the MS degree. The final decision will be made by the Program Director with advice from the Graduate Training Oversight Committee.

### **3L. BPHYS Student Advisory Board (BSAB)**

BSAB is a student-run organization whose job is to act as a liaison between students and the administration, to advise and mentor incoming and junior students, and to propose and initiate improvements in program organization and practices. BSAB plays a significant role in the planning and organization of the yearly recruitment event. Members also manage student social activities and determine appropriate use of student activity funds available from the BSD and PSD. BSAB consists of elected representatives of senior cohorts; elections are held each year electronically on an opt-out basis. The rules and procedures of BSAB are established by the students and reported to program administration.

### **3M. Program Petitions**

The BPHS program strives to provide research training that is tailored to the needs and aspirations of individual students. Every aspect of the program that is under the authority of the program directors can be altered through a simple internal appeals process, and many policies beyond the authority of the program directors are also open to appeal. The process begins with a written request addressed to the program directors and submitted to the Program Administrator. For issues beyond the authority of the Program Directors, the student will be assisted in directing the request to the appropriate authority. All petitions will consider the background and goals of the individual student. Therefore, the results of petitions are not automatically applicable to all students. Please meet with Adam Hammond before submitting a written petition that addresses courses taken to fulfill program requirements.

### 3N. Additional Requirements

These policies are subject to change. University policies, the requirements of funding agencies, civil regulations, and any other authority outside of the control of the BPHYS program may cause these rules to be modified. Students are required to meet all such future requirements.

### 3O. Grievance Policy

A grievance is a problem or conflict that cannot be resolved by the student alone. Students with grievances are encouraged to bring them to the attention of the appropriate academic official. Students have three broad options for the resolution of grievances: Their faculty mentors, the administration of the Biophysical Sciences Graduate Program, and Division-University-wide resources.

i) For many grievances, the student's thesis advisors or other faculty mentors (in particular the chair of the student's thesis committee) may be the best place to begin. All faculty members are expected to respond promptly to an expressed grievance, and may either address the problem directly or advise the student on other options.

ii) Students may bring a grievance to any of the Executive Committee members listed at the beginning of this handbook. The program official to whom the student brings the grievance will meet with the student to discuss and attempt to resolve the grievance. This conversation will begin with a discussion of applicable confidentiality expectations. This official will work with the student to resolve the grievance, and arrange appropriate additional contacts and resources. Actions to resolve a student's grievance will be developed with the student's participation and full knowledge.

iii) Students may also avail themselves of other university resources, such as the Student Counseling Center or Deans of Students (BSD or PSD) to resolve the concern.

Complaints about sexual harassment or discrimination and harassment on the basis of race, color, religion, sex, sexual orientation, gender identity, national or ethnic origin, age, disability, veteran status, genetic information, or other protected classes under the law are addressed under the University's unlawful discrimination and harassment policy. For more information, please see:

<http://studentmanual.uchicago.edu/page/policy-harassment-discrimination-and-sexual-misconduct>

Other divisional resources regarding Grievances may be found here.

[http://gradprograms.bsd.uchicago.edu/current\\_students/policies.html](http://gradprograms.bsd.uchicago.edu/current_students/policies.html)

<https://physical-sciences.uchicago.edu/page/greivance>

### 3P. Handbook

The BPHYS policies described in this Handbook are updated annually or when changes are required by Divisional or University policy. Students are expected to be familiar with the content of the current Handbook and to comply with policies therein; however courses approved for selective credit and qualifying examination outcomes are part of the student's permanent record and will not be affected by changes made in subsequent versions of the Handbook.

### **3Q. Financial Support Statement**

Financial support is guaranteed for five years provided that students remain in Good Standing.

All Ph.D. students are supported on training grants, research grants, external fellowships, departmental funds, or Program funds. During the first two years (8 quarters), students shall be supported on training grants, fellowships, or Program Funds. After 8 quarters, students shall be supported on fellowships or research grants (or departmental funds if research grants are insufficient).

During the first two years, tuition, health insurance premiums, and student life and activity fees are paid directly, and the student is provided with a quarterly stipend. Beginning in year three the student is supported with faculty funds in the form of a monthly salary. The salary rate includes stipend and additional funds to cover insurance and fee expenses. Note that when support is received through this mechanism the student is responsible for paying his or her own insurance and fee expenses, which are detailed on the monthly bursar bill. Tuition is covered for the student and is not included in the salary.

The student must also be aware that when their mechanism of support changes from quarterly stipend (paid in advance) to monthly salary (paid in arrears) there is a lag in pay, since stipends are distributed at the beginning of the quarter and salary is paid at the end of each month. Accordingly, students should be aware that the transition from one funding source to another may require some financial planning.

### **3R. Travel Support Policy**

The Program encourages travel to scientific meetings and provides partial reimbursement for eligible travel related expenses. Original receipts are required.

In Year one, students will be reimbursed for required travel including the Molecular Biosciences retreat and the Biophysical Society meeting.

During Years three and four, the program will contribute a one time travel grant of \$1000. Petitions to use this allowance for travel during Years two or five will be considered. It is up to the student and advisors to determine when it is best to use this support. To receive reimbursement students must:

- have already applied for divisional support and, if available, meeting support;
- complete the application for reimbursement prior to travel;
- present a poster or oral presentation;
- provide proof that they have either presented a poster or a talk, e.g. meeting program; and they
- submit original receipts to program administrator within 30 days of return.

## **Appendix A: BPHYS dissertation requirements and recommended procedures**

In order to earn a Ph.D. from The Graduate Program in Biophysical Sciences (BPHYS), the student must produce a sufficient body of original research, as judged by their Thesis Committee. The student must create, defend and submit a written dissertation on this research.

The Thesis Committee is tasked with ensuring research progress and communicating dissertation completion requirements to the student. The following steps are recommended to accomplish these goals:

During the meeting before the penultimate, the Committee should inform the student of tasks required to produce an adequate body of work for the dissertation. The student should also be informed of any requirements for publications resulting from dissertation work that the Committee may impose. An expectation is that a first author manuscript resulting from dissertation work will have been submitted to a journal.

The penultimate meeting should document that all committee requirements are fulfilled. The penultimate meeting may be used to defend the research that is to be included in the dissertation. If the Committee intends to use the meeting as such, this should be communicated to the student before the meeting. All data and figures for the thesis should be presented as well as a thesis outline. It is expected that the thesis will be completed by four months after this meeting.

After the penultimate meeting, the student will work with the advisors to produce a written dissertation of sufficient quality to meet committee expectations. When the advisor(s) and Committee Chair believe that a satisfactory document is forthcoming, the defense can be scheduled.

The student is required to distribute the dissertation to the Committee at least two weeks before the defense.

If concerns arise within the committee after the defense is scheduled, all committee members, the student, and the Program should be notified. It may become necessary to reschedule the defense.

### **Final Examination for the Degree of Doctor of Philosophy:**

Procedures for the dissertation defense shall be determined by the Thesis Committee. The defense is typically a public presentation to which all are invited followed by a private session in front of the Thesis Committee.

If concerns arise as detailed above, the defense may be rescheduled by the committee at any time.

### **Student responsibilities after the Final Examination:**

Dissertation submission to the University Dissertation office must adhere to official guidelines and timetables. Once the final draft of the dissertation has been uploaded by the student, the department will contact the committee for concurrence on post-defense changes. Once concurrence from the committee is received, the Program Director will approve the dissertation.



## **Appendix B: Default Rotation Plan**

1st rotation period (10 weeks spanning Spring Break, starting the 8<sup>th</sup> week of Winter Quarter through 5<sup>th</sup> week of Spring Quarter) - As part of the Lab Course, students will prepare a rotation plan that includes both project and broader objectives.

2nd rotation period (6<sup>th</sup> week of Spring Quarter into Summer) - Rotation 2 lasts 8 weeks (lighter course load in spring, no courses in summer)

A Rotation Form must be turned in to the Program Administrator by the first day of each rotation period.

For each rotation period, identify a "current" and "projected" advisor as a means of exploring a co-advising relationship between them and communicate this clearly to each advisor.

At least one of the advisors should change between the 1st and 2nd rotation periods.

During a rotation period, the partition of student effort between the primary and secondary advisors can take on various forms as best fits the specific case. This arrangement should be explicitly stated on the rotation form and understood by all participants. It is the student's responsibility to make sure that everyone understands the plan. Examples include:

Example A) Work on a project 100% in the primary advisor's lab. This project may or may not be directly related to a specific thesis project but will get you acquainted with techniques and approaches used in the lab. Attend lab meetings of both primary and secondary advisors during the rotation. Initiate discussions with both advisors regarding what a jointly mentored project could look like.

Example B) Work on a project that uses the resources/skills in the primary advisor's lab, but also requires expertise in the secondary advisors lab so the student is working on a truly jointly mentored rotation project and spends time in both labs. Attend lab meetings of both labs and initiate discussions with both advisors as to the nature of a jointly mentored project.

Example C) Spend 50% of the rotation period (4-5 weeks) working in primary advisor's lab and the other 50% of the time working on a distinct project the secondary advisor's lab so as to get exposure to both labs. Attend lab meetings of both labs for the full rotation period. The minimum level of involvement for the secondary advisor is a weekly meeting (usually their group meeting).

## **Appendix C: Policy on Internships**

The BPHYS program has largely adopted the BSD policy, with only change being that petitions will be decided by the BPHYS Directors.

### **Background**

This policy recognizes that many BSD graduate students wish to participate in part-time internship opportunities during their graduate education in order to: (1) take advantage of broad on campus resources to enhance their exposure to potential career paths post PhD; (2) build and enhance their transferable skillset; (3) build their professional network; and (4) assist them in establishing a clear plan towards graduation and next steps. Reciprocally,

transferable skills developed during internships – in communications, data analysis, translation of research etc. – have strong potential to feedback positively on students’ dissertation work and on the broader research community of their lab and beyond.

Of relevance, NIH recognizes a need for training beyond the primary dissertation research experience: “Uniform Guidance 200.400(f) requires the recognition of the dual role of all pre- and post-doctoral staff, who are appointed to research positions with the intent that the research experience will further their training and support the development of skills critical to pursue careers as independent investigators or other related careers. Neither Pre-Docs nor Post-Docs need to be specifically appointed in ‘training’ positions to require recognition of this dual role.”

In addition: “Beyond the full-time training (typically 40 hours per week according to NIH), NIH recognizes that Kirschstein-NRSA fellows and trainees may engage in part-time employment incidental to their training. Fellows and trainees may spend on average, an additional 25% of their time (e.g., 10 hours per week) in part-time research, teaching, or clinical employment, so long as those activities do not interfere with, or lengthen, the duration of their NRSA training.”

Currently, BSD students complete two registered TA-ships (one may be substituted by a TA training class) as an academic requirement, and also have opportunities to TA beyond that requirement and receive payment. TA- ships are considered to be 10 hour per week appointments.

In addition, BSD students are also eligible for myCHOICE internships, which are registered, unpaid, 10 hr/week, quarter-long mentored and evaluated experiences that carry a half course credit. Potential interns must be admitted to candidacy (although students may petition the Program for an exception) and both advisors *must* agree to the experience.

## **Policy**

1. Part-time graduate student professional experiences, beyond the student’s primary research project or program-recommended class work, that require 5-hrs or more effort per week (whether paid or unpaid), should be evaluated in accordance with this policy.

2. Professional experiences include, but are not limited to:

- †myCHOICE internships

- †other internships in offices on campus

- †other internships off campus

- †paid TA-ships beyond the divisional (or Training Grant) program requirement

- †research assistantships unrelated to dissertation research

- †elective classes in divisions beyond BSD or PSD

- †Chicago Center for Teaching fellowships

- †Innovation Fund Associates Program at the Polsky Center for Entrepreneurship and Innovation

- †TechStart program with the Polsky Technology Commercialization Office

3. It is expected that the majority of appropriate experiences will take 10 hours a week or less. Note TA- ships for pay are allocated 10 hrs per week, as are myCHOICE internships. Part-time internships/professional development experiences should never exceed 15 hrs per week.
4. Students who wish to participate in any of the listed professional experiences should first approach their thesis mentor for input and permission. (Note that myCHOICE internships have a formalized mentor sign-off requirement).
5. In cases where the student and mentor disagree on whether the experience is appropriate, students may prepare a written petition describing the nature of the experience, the start date, the time commitment (including travel time if off-site) in hours per week, the number of weeks, how they plan to avoid loss of research productivity, and the value of the experience. The petition should be submitted to all members of their thesis committee and the Program Directors, with the Program Administrator copied.
6. The thesis committee members, together with the Directors, will evaluate whether the professional experience is appropriate for the student based on their knowledge of the student and the thesis project. Relevant issues to consider include the student's stage in their thesis work, their progress to date, their demonstrated ability (or lack of ability) to juggle competing assignments, the synergy between the proposed professional experience and the thesis work, and the potential value of the experience in the student's career development.
7. Deliberations will typically be electronic and on a short time frame, taking into account the requested start date of the professional experience. In some difficult cases a meeting (with or without the student) may be useful. While it is recognized that the advisor has more relevant information than other committee members, the adviser does not have automatic veto power. The thesis committee chair will evaluate all arguments and make a final written recommendation to the Directors, copying the program administrator.
8. The Program Directors, who may solicit additional input from the program's curriculum or steering committee if desired, will make a final decision and inform the student of that decision.
9. The program administrator will retain petitions and decisions in the student's file.
10. Typically, students should not complete more than 3 part-time quarter-long professional experiences during their tenure.
11. Students who have entered the 7th year of studies (25th quarter) should no longer be participating in professional experiences.
12. Students should not typically be involved in internships in the quarter of graduation, however, it may be appropriate for a student to perform an internship after their defense has been completed if the timing of the defense requires that they be registered for the remainder of the quarter.
13. BSD students occasionally take leaves of absence for one or more quarters to pursue full-time internships off campus. While we view this as a different class of experience to the part-time internships discussed above, the process described in points 4-10 above could similarly be used to evaluate whether the internship is appropriate for the student.

## **APPENDIX D: Changing Advisors**

In order to provide clarification on the process of transitioning research from one mentor's group to another, the message below outlines specific information about what steps the program requires, as well as student responsibilities. When a student is without any advisor, they can expect to receive a letter that notes that their research is in a transition period and that they are currently without advisors.

Dear student,

We are writing because your research is in a transition period, and you are currently without advisors. This happens from time to time and is not a cause for undo concern. The program understands that you are facing challenges during this period and we want to let you know what assistance the program will provide, as well as your responsibilities during this transition.

The program will provide six months of full financial support to ensure that you have time to explore options for new advisors. When you secure new advisors, the program will work with them to ensure a smooth transition of your financial support. If potential new advisors have any questions about their financial responsibility, please refer them to program staff or leadership. You are not expected to address these issues yourself.

The program is ready to help with support and resources during this transition phase. We encourage you to seek advice from whomever you wish during this time, including program leadership, faculty trainers and staff. We are all happy to assist you and you should feel free to seek advice from multiple sources. Members of BSAB are also available to discuss this transition with you; please feel free to contact a BSAB member to connect with a student mentor.

During this transition phase we require that you check in once a month with a written communication to Michele Wittels describing your efforts to find new advisors. These updates will help us to give you appropriate guidance, facilitate your transition, and remain up to date on your progress.

At the end of the 6 month transition period, if an advisor has not been secured, a reassessment will be made by program leaders, in consultation with you. Financial support beyond the six month transition period is not guaranteed.