

# **PBSB ADMISSION TO CANDIDACY EXAM (ACE)**

## **Requirements and Procedures**

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### **Document relevance**

This documents details the Admissions-to-Candidacy Examination Guidelines of the Physiology, Biophysics, and Systems Biology (PBSB) graduate program. The guidelines in this document summarize and expand upon those detailed in Section X.C of the Weill Graduate School Code of Legislation and the form entitled *Regulations for the Admission-to-Candidacy Examination*. Clarification should be sought from the PBSB Program Coordinator about any perceived conflict between these three documents. Tri-I students under the umbrella of the PBSB program should also follow these guidelines, except where noted by their respective Tri-I program.

### **Prerequisites**

Prior to taking the ACE, the student must have satisfied all course requirements established by the PBSB Program. Any exceptions must be approved by the Program.

### **Timing**

There are three key dates for progressing through the ACE:

- By January 31<sup>st</sup> of the student's second year in graduate school, the student must have a) formed their ACE committee and b) received approval from their committee on the ACE topic and the Specific Aims page of their ACE.
- By April 30<sup>th</sup> of the same year, the student must have received approval from the ACE committee on the Written portion of the ACE.
- By June 30<sup>th</sup> of the same year, the student must have taken the Oral component of the ACE examination.

Failure to meet any of these deadlines results in the student being placed on probation for a period of three months, except in extenuating circumstances as approved by the Dean. Probation is lifted, and "good-standing" is restored, by proceeding to the next stage of the ACE process. If the student does not meet requirements at the end of the three-month period, the student will be dismissed from the graduate school unless the Dean chooses to extend the probationary period.

### **Structure**

The ACE consists of a tutorial study program resulting in a written research proposal and an oral component.

- The purpose of the ACE exam is to demonstrate that the student has attained a breadth of knowledge and depth of understanding commensurate with the high standards of the Doctor of Philosophy, and that the student is prepared to undertake full time thesis research. Accordingly, this examination should be a rigorous and meaningful determination of the student's ability to employ and interpret information in an area of specialization and in a more general context.
- The proposal to be defended can either be 'on thesis' or 'thesis related'. On thesis proposals will cover the student's progressing and planned thesis work. Thesis related proposals will present and defend a research plan that is on a subject related to the student's thesis project. The determination of which ACE examination format will be

completed is made by the student. Tri-I students should consult with their respective programs for specific guidance.

- For 'on thesis' examinations, recognize that although preliminary data is not required, proposals with technical novelty will need to defend feasibility.

### **Committee**

The ACE committee will be comprised of one ACE Committee Chairperson, to be selected by the Program, and at least three examiners to be selected by the student. Additional examiners are permitted and may be requested by the student, the committee, the Program, or the graduate school. Typically, one of the examiners will be the student's thesis advisor (note that the thesis advisor may not also serve as the Chairperson). Every member of the ACE committee must be a member of the Weill Graduate School faculty, unless otherwise allowed by the Dean's office. Exceptions for Tri-I students are automatically approved as detailed in the *Regulations for the Admission-to-Candidacy Examination*.

During the written process, committee members are expected to provide some guidance; however, committee members may not write or be directly responsible for any part of the proposal. It is expected that the committee members be available for discussion and feedback on the proposal details. The committee members are encouraged to provide feedback and critique at the level that they would when writing summaries for R01 reviews.

During the oral process, committee members are free to pose any question commensurate with the aims of the ACE, but are not free to provide answers or direct guidance. The thesis advisor is also free to ask questions. The Chairperson is responsible for ensuring the fairness of the questioning.

### **Exam Introduction**

As the first step of the examination, the student should discuss with their advisor the format of the ACE to be followed and the topic to be defended. The student should then formulate a one-page, specific-aims summary of their proposal. The student should then use this aims page as an introduction to their project as they seek to identify committee members. Once the committee is defined, the student should ideally organize a pre-meeting with their committee to formally introduce the project and discuss any amendments to the plan. The purpose of this meeting is largely to determine if the scope of the ACE proposal is appropriate. Once the committee agrees that the aims and plan are well chosen, the student should commence with writing the ACE exam. If a full committee meeting cannot be scheduled in a reasonable timeframe, the student should seek similar guidance through individual meetings with each committee member. As specified above, this first step must be completed by January 31<sup>st</sup> of the student's second year in graduate school.

### **Written exam**

The student should take ~2 months to complete the written portion of the examination. The proposal must follow the format of a NIH R01 research grant proposal. The written research proposal should be no more than 12 pages in length (excluding the title page, 12 pt. font, single-spaced, 1" margins), including figures, but not counting references. The proposal will consist of:

- 1) Title page (Title, Advisor, Committee)
- 2) Specific Aims - State the problem to be addressed and the specific aims of the proposed research. The importance of the problem at the molecular, cellular and organismal levels should be discussed. If pertinent, it is important to address the possible clinical relevance. (required length: 1 page)

- 3) Research Strategy - Significance: General background, significance in terms of basic science and disease relevance.
- 4) Research Strategy – Innovation: Explain how your proposal differs from what others have tried.
- 5) Research Strategy – Approach: More specific background information. Describe in detail the experimental design and research methods to be used. Technical hurdles to be overcome should be mentioned. Alternative approaches should be given for experiments that may not be feasible. Discussion of expected or possible results and their interpretation. Best format for each specific aim: a) rationale, b) methods, c) expected results, d) alternatives. Theory aims should follow a similar structure where possible.
- 6) References should be comprehensive and cited in full at the end of the entire proposal. Avoid leaning too much on review articles; expect to get questions on the primary literature.

See [www.niaid.nih.gov/researchfunding/grant/pages/appsamples.aspx](http://www.niaid.nih.gov/researchfunding/grant/pages/appsamples.aspx) for sample R01s.

The student should consult with the members of the ACE Committee while preparing drafts of the proposal. Once the committee receives the proposal, members are obligated to read and evaluate the proposal within two weeks. Committee members can approve the proposal as written or request revisions and resubmission. Before the oral component can be scheduled, all committee members must approve the written proposal through communication with the Program Coordinator. Each member of the committee is encouraged to provide the student with a short written critique of the proposal.

Note that if the student is seeking a terminal Master's degree, they should alert the committee of this intention by the time they have submitted their written proposal. In such cases, once the committee gives the student a "Pass for Master's" designation, the Oral examination may be scheduled.

### **Oral exam**

After the written proposal has been approved by the committee, the oral examination should be formally scheduled with the Graduate School office. The formal scheduling must occur at least two weeks in advance of the oral examination date.

At the start of the Oral exam, after all members are convened, the student will be excused from the room. During this time, the committee will discuss the student's academic process, the written ACE exam, and any other pertinent issues.

The oral examination will then continue with a presentation by the student describing the salient features of the written proposal. The prepared presentation should be 45 to 60 minutes, but it may last longer if the committee chooses to ask extensive questions during the presentation. During and/or after the presentation, the committee will question the student. The committee's questions will likely focus primarily on the significance of the problem addressed, the basic biological principles governing the problem, and the logic of the experimental approach used. Furthermore, the committee will probe the student's knowledge of the relevant scientific areas (thus, any question is "fair game"), thereby ensuring that the student is an appropriate doctoral candidate in the PBSB.

When the discussion has concluded, the student will again be excused from the room. The committee will discuss and vote on the exam according to the rules of the Graduate School. The committee will make a written evaluation of the student, which will be forwarded to the Graduate

School by the committee chairperson. The committee will convey the assessment to the student before the committee disperses. At a later date, the student will receive a comment of the committee's written comments (but not the voting).

### **Grading**

*Passed exam:* Handshakes, hugs, kisses ... now get to work!

*Tabled exam:* If, according to the voting rules of the Graduate School, the ACE committee tables the student's ACE exam, the student must attempt to correct deficiencies as specified by the committee within one year, or according to a time frame established by the Committee.

*Pass for Master of Science:* The PBSB ACE rules for Master's degrees are as defined by the Graduate School. If the student has already indicated during the written stage that they are seeking a terminal Master's degree, the committee's evaluation of a successful Oral examination will be that of "Pass for Master of Science." Alternatively, if the committee, before or during the examination, comes to the conclusion that the student is not a suitable candidate for the PhD, the Master's degree may also be granted.

*Failed exam:* If, according to the voting rules of the Graduate School, the ACE committee determines that a student has failed her/his ACE exam, then the student will be dismissed from the graduate school. Appeals may be filed with the Dean's office.

### **Formal Feedback**

After the examination, the Chairperson will provide written feedback to the student and the Program summarizing the Committee's evaluation of the strengths and weaknesses of the student's proposal, presentation, and overall preparedness for proceeding with full-time thesis research. Where possible, the Chairperson should summarize specific suggestions and resources available for improvement.