

Policies and Procedures for the Qualifying Exam, Spring 2015 Graduate Program in Neuroscience, UMass Medical School

DISCLAIMER. All Qualifying Examinations must meet the minimum standards set forth by the Graduate School of Biomedical Sciences (GSBS). This document is intended to clarify and expand upon the GSBS Standards for the Qualifying Exam, and to provide Program-specific information regarding the detailed mechanics and intent of the Exam process.

If the standards appear in conflict, the GSBS standards supercede.

If you identify an apparent contradiction, please let Dave Weaver know.

Summary. The Qualifying Examination is intended to determine whether a student has sufficient ability and preparation to undertake independent research leading to a Ph.D. degree. The Exam is also an opportunity for the student to learn how to develop a novel research proposal.

The Qualifying Examination in the Program in Neuroscience will consist of developing and defending an original research proposal that addresses a research problem. The research problem is often related to the student's thesis project, although a topic unrelated to the student's research project is acceptable. After choosing the topic, the student will prepare an abstract describing the hypothesis to be tested and the experimental approach(es) to be taken. An abstract meeting is held to review the scope of the proposal and determine whether the approaches chosen can reasonably address the hypotheses proposed. Upon approval of the abstract by the Qualifying Examination Committee, the student will prepare a written proposal including background with literature references, proposed experiments, and interpretations of probable outcomes. An oral examination will then be held, in which the student will defend the proposal and answer questions from the Committee on any subject with which the student should be familiar, whether or not it is directly related to the subject of the research proposal.

Guidance. The Director of the Graduate Program in Neuroscience (Dr. David Weaver, LRB-723, 508-856-2495) will advise students on Examination policies, appoint Qualifying Exam Committees, and ensure that deadlines are met, by both students and Committees.

Timing of the Qualifying Exam.

GSBS PhD Students: The Exam may be taken in the Fall or Spring semester of the second year of study. For students that affiliate with their thesis lab by September 1 of their second year, the Qualifying Examination defense must occur before the end of the Spring semester of the second year of study. Students taking Introduction to Neuroscience (BBS 760) in Spring of their second year, and students whose thesis advisor selection was delayed beyond September 1 may request an extension of time for completing the QE. Extension requests and a proposed timeline should be submitted to Dr. Mary Ellen Lane and Dr. Weaver.

MD/PhD students. The MD/PhD Program requires that MD/PhD students complete the QE within 6 months of entering full-time research study, and the MD/PhD Program retains primary responsibility for appointing the Committee and conducting the Qualifying Exam.

Transfers. Students changing their Program after passing a Qualifying Exam in another Program may be required to pass a new Qualifying Exam within 6 months after transfer to the Neuroscience Program. The Neuroscience Program Director (Dr. Weaver) will determine whether a second qualifying exam is necessary.

Step-by-Step Procedures.

1. Select the Topic

All Programs in the Graduate School of Biomedical Sciences allow students to write on their own thesis research problem. A student may write on an unrelated (but Neuroscience-based) topic if they choose.

The student will select the topic, and may have discussions with the PI and other faculty members in refining the ideas, provided that the student, rather than faculty, is primarily responsible for developing the research plan. Faculty may assist by assigning/recommending reading material, indicating areas of the research plan that may not seem feasible or well-connected to the remainder of the proposal, and indicating areas where further development of ideas is necessary.

For the purposes of the Qualifying Exam, the research problem must be narrow enough to ensure that all elements (i.e., Specific Aims, Background, Rationale, Experimental Design, Expected Results and Interpretation) can be included in the written proposal in detail adequate for evaluation by the QE Committee.

2. Form the Qualifying Exam Committee

The student and mentor should develop a list of at least four proposed candidates for the committee. This list and the proposed topic will be given to the Graduate Program Director (Dave Weaver), who will then select four members to serve on the Committee. An experienced “General Examiner” will be assigned to each student’s QE Committee by the GSBS Dean as the fifth member. The General Examiner need not be an expert in the subject of the qualifying exam (see last 3 pages of this document for the GSBS Scoring Rubric and the General Examiner policy).

Once the proposed composition of the Committee is approved, the student should ask the potential Committee members if they are willing to participate. This request should be accompanied by a brief indication of the proposed topic. (I suggest asking the prospective Chair to agree to this role first, before asking other faculty. If the ‘desired’ Chair does not agree to this role, then another member of the committee can be asked to be Chair ... without knowing they were the second choice).

Complete the QEC Selection Form, with signatures (student, PI, QE Chair, Program Director), and turn it in to the GSBS office.

3. The Abstract Development and Approval Process

a. Faculty Role in Abstract Development.

*The intention is to have **the student** learn how to develop an idea into a research proposal.*

Faculty members represent a critical resource for the student and should be available to participate in the abstract development process, but the student must play the major role.

If the student has access to a grant from the PI’s lab, then the student’s proposed studies must not overlap significantly with the studies designed in the grant, and the literature discussion should be the student’s synthesis, not that of the PI. The student may develop original experiments to extend the PI’s proposed research, but may not simply re-word experiments written by the PI.

b. The Written Abstract

The written abstract will provide a brief introduction to the area of investigation, the problem

to be investigated, and the major methods of study, in the form of specific aims to address specific hypotheses. The abstract should consist of:

- (i) a **title page** listing the title, author, and listing the advisor and committee members, and the date and location of the Abstract Meeting if known,
- (ii) Then, **one page** of text, single-spaced, containing a brief introduction and the specific aims of the proposal.
- (iii) References are not included in the one page limit, but references should be cited in the abstract and a list of references cited should be included.

Page Definition. For the purposes of Graduate Program in Neuroscience QE Abstracts and Written Qualifying Exams, a “page” is defined (using the NIH criteria) as a 8.5 x 11 inch page with 0.5 inch borders all around, e.g., a printed area of 7.5 x 10 inches. Fonts should be Times 12, Times New Roman 12, Arial 11 or Helvetica 11. Symbol fonts may be used as needed. (Saving the document as a pdf helps symbol fonts display properly on other computers).

c. The Abstract Meeting.

The Written Abstract should be sent first to the QEC Chair. The Chair may provide feedback or request revision. Once the Chair has approved the abstract, the Chair or student sends it to the other Committee members. The Abstract Meeting should be scheduled for 1-2 hours. Doodle polls are useful.

An Abstract Meeting provides the student with the opportunity to become familiar with the process of presenting to the Committee and to get direct feedback from the committee members. The other objectives of the abstract meeting are to review the scope of the proposal and to review the approach, to determine if these can address the scientific question being addressed, and finally to review with the student the expected format and purpose of the written proposal and of the oral exam (“defense”).

The student’s mentor may be present during the abstract meeting, but only as an observer, not as a participant. The mentor is not required to attend. An abstract meeting may proceed even if not all committee members are able to attend.

The outcome of the Abstract Meeting is in the form of recommendations to the student. There is no pass/fail result from this meeting. If there are significant recommendations, these are summarized by the Chair and distributed to the student, the mentor, and the committee members.

The Committee may request that the student submit a revised Abstract to reflect the recommendations made by the committee. This abstract is considered approved upon submission. Alternatively, the student may incorporate changes in the abstract when revising this page into the specific aims page of the full proposal. The date of submission of the revised abstract, or the date of the abstract meeting (whichever is later) starts the clock.

d. Set the Time-line

Approval of the Abstract starts the official clock. The written proposal must be distributed to the Committee within five weeks of abstract approval. The oral defense of the proposal should occur 7-14 days after distribution of the written proposal. (Exceptions regarding the defense date may be made to accommodate faculty availability).

The student should propose dates for the oral examination. (Doodle polls are helpful). The student will also identify a location, which should be reserved for a 2.5 to 3-hour period (Tara Keegan at x 6-6801 can assist with reservations).

The Chair of the Committee is responsible for corresponding with other faculty to keep the process on track. In agreeing to serve on a Committee, the faculty members are also agreeing to provide timely responses and to give appropriate priority to the meeting(s) within their schedule.

Postponement of the Oral Exam to allow additional preparation time is not allowed. Postponement in case of inclement weather, illness, or other unanticipated crisis is subject to approval by the Graduate Program Director and Committee Chair.

4. The Written Qualifying Exam is to be the student's work.

The *student alone* is responsible for the preparation of the written exam material. The lab PI/mentor may not edit the exam or provide input specifically on the written exam. It is recognized, however, that the student and mentor will interact regarding the student's project. The intent is to be sure that the written exam is the student's work, not the PI's, but without making the student avoid contact with the PI regarding ongoing research. The PI and other faculty, students, postdocs and staff may be consulted for technical questions about general methods, approaches, and may help the student understand published work.

As in all academic work, directly quoting (copying) the work of others without quote marks constitutes plagiarism. Stating the ideas of others as though they are your own is also plagiarism; ideas and concepts coming from others must be acknowledged by referencing. Plagiarism is a serious offense of the Honor Code, and is grounds for dismissal from the Program and the School.

5. Components of the Written Exam.

The written exam will consist of:

(A) **A title page.** (Limit: One Page). List the proposal title, student and mentor, committee members, date of submission and the date, time and location of the oral exam.

(B) **A Specific Aims page.** (Limit: One Page). Summarize the objectives of the proposed research. This will likely be very similar to the revised Abstract.

(C) **A RESEARCH STRATEGY section.** (Limit: Six pages). This 6-page limit *includes* figures and figure legends. The page limit does not include the bibliography. The length is not negotiable; word and page limits are a fact of life in science.

The RESEARCH STRATEGY section is similar to an NIH grant (PHS form 398). For real examples, see: <http://www.niaid.nih.gov/researchfunding/grant/Pages/appsamples.aspx>

The RESEARCH STRATEGY section should include the following sections and address the following issues:

(i) Significance. Why is this an interesting problem? What published work is relevant to the proposal? How do published results lead to, support or conflict with the overall hypothesis? What is the "critical unmet need" that will be met by this proposal?

(ii) Preliminary Studies – if any. Preliminary data are not needed for a QE! This is a thought exercise portraying how you would pursue the project, but preliminary data can be helpful. Indicate the source of all Figures in the corresponding legend if not your own work.

(iii) Approach. (This should be the majority of the proposal). For each proposed study/ aim, provide the Rationale, Experimental Design, Expected Results and Interpretation. The student is particularly advised to think about possible complementary experiments, alternative strategies and interpretations, and the shortcomings of the proposed experimental design, and discuss these aspects when interpreting each experiment.

It is often good to end the Research Strategy section with a very brief summary or concluding comment highlighting the expected overall outcome and importance of the proposed work. What advances will result if this project is completed as proposed?

(D) Bibliography. (Not included in 6-page limit; no limit) The bibliography should be sufficiently comprehensive to include all of the pertinent references, but should not exceed 50 references. *If a paper is cited, it will be assumed that it has been read and that the student is familiar with its details.* References should be cited using a consistent style that includes all authors and the full title of the paper. We have free access to a web-based bibliographic software (Refworks) that can be used for this purpose- ask Dr. Weaver for a “how-to” guide.

(E) Contributions. One page. This page should describe the role the PI and other faculty members have played in development of the proposal, if significant. This page is usually necessary only if the student has submitted a grant application on the project and the PI contributed to the grant submission, and thereby indirectly to the Qualifying Exam. (In this case, it is typical that the student would be expected to develop an additional aim that is not included in the grant submission and thus is independent.)

6. The Oral Qualifying Exam (a.k.a. the "Defense").

a. Timing. The Oral Exam should take place 7-14 days after submission of the proposal to the Committee. Exceptions to this timing need to be approved by the QE Chair and the Program Director, and are limited to accommodating faculty availability.

The student’s research advisor may not be present during this exam.

b. Preparing for the Oral Exam. The student may practice the oral presentation in front of other students, and post-docs, and may solicit their comments. Faculty may not participate in practice talks if done solely for the purpose of practicing for the exam. (Presentations of ongoing research by the student in a lab meeting, departmental seminar, or a similar forum that would solicit faculty input is acceptable, provided its emphasis is not as a practice talk to prepare for the Oral Exam).

c. What happens during the Oral Exam?

The student is asked to step out and the Committee has a preliminary discussion of their impressions of the Written Exam, identifying areas to focus on, and deciding how to proceed in the exam. If not already done during the Abstract Meeting, the Committee will review the student’s overall academic record and progress in graduate school at the beginning of the Oral Exam Meeting. The student’s transcript from the GSBS office and a brief letter from the PI, regarding the student, are discussed with the student absent from the room.

The Oral Examinations will consist of a presentation and defense of the proposal by the student. The student should prepare a 40-minute presentation with background, hypothesis and an outline of the aims, then more detailed experiments within each Aim. The student leads the Committee through the aims and experiments. Committee members will ask questions related directly to the proposal and more general questions that may be related only distantly. Thus, the exam may cover any material that the Committee feels the student should know as a result of their coursework up to the time of the exam, including the GSBS Core Course, the “Introduction to Neuroscience” Course, and advanced topics courses the student has taken. (Students that have not completed the “Introduction to Neuroscience” course at the time of the exam will be required to take and pass the course the next time it is offered.) The assessment of general knowledge may take the form of a separate “general knowledge” question-and-answer period, at the discretion of the Committee. The exam will include discussion of methods and approaches

proposed by the student in the experimental research plan, or methods that would be reasonable and established alternatives to the methods proposed.

d. Advice: Practice. I very strongly recommend that each student practice the exam in front of other students (including some who are post-qualifier) and postdocs (but not faculty). This audience should be instructed/ challenged to interrupting the student repeatedly to ask for clarifications, ask about methods, alternatives, rationale, etc., as will happen in the real Oral Exam. I also recommend that all the students going through the QE in a given year help each other by participating as audience members during each others' practice talks.

7. Evaluation Criteria, Outcomes, and Notification.

A scoring rubric has been implemented by the GSBS. The 2014 rubric is included on the following pages, which also explains the General Examiner concept and briefly lists the potential outcomes of the exam.

The outcome of the Qualifying Exam is decided by vote of the members of the Qualifying Examination Committee. A student fails if more than one member of the committee votes for failure. Generally, these decisions are reached by consensus.

The 2015 rubric has not yet been developed, so the 2014 rubric should serve as a guide. Similarly, the exact wording of the potential outcomes is still being discussed at the GSBS level. Below is my best guess as to the possible outcomes for 2015:

(1) Pass. Congratulations and proceed to thesis work.

(2) Revise. *This is a frequent outcome.* Revising can mean editing the original document or writing a supplemental essay.

After the Oral Defense, the Committee Chair will summarize the weaknesses of the written proposal, in writing, within one week of the meeting, and will give this to the student to focus the revision process. The student must address these specific points by re-writing the relevant sections of the written proposal. These revisions must be completed within 2 weeks of receipt of the critique. The Committee will evaluate the revised proposal. A second type of revision is to require the student to prepare a brief written response ("supplemental essay") to address specific questions, separate from the written proposal. This would occur if the oral exam revealed an area of deficiency that should be readily addressed by the student. This supplemental material must be submitted within 2 weeks of receipt of the critique. The supplemental essay is giving the student the opportunity to show/improve their knowledge in an area that may have been poorly presented in the written or oral exams.

The Committee may delegate a subcommittee or the Chair to evaluate the revised proposal or supplementary essay. If this subcommittee evaluation concludes that the revision is inadequate, the entire Committee must review the material and all members must vote on the outcome (i.e., the student cannot be failed by a subcommittee).

3) Not Passed - Re-test. (Re-examination). The student may be offered the opportunity to repeat portions of the oral exam or the entire oral exam, with or without revision of the written exam. The Committee Chair must summarize in writing the areas of deficiency that are to be addressed within one week of the first oral exam meeting, and the student must address these specific points by re-writing the relevant sections of the written proposal and presenting a second oral defense. These revisions and the re-test must be completed within 3 weeks of receipt of the critique. The Committee will then evaluate the new material and assign a grade of Pass or Fail.

(4) Remediation. The Committee may require that the student take specific courses or activities, within a specified timeline that exceeds the 2-3 weeks for revisions and retest as

described above. The QE will be considered complete when these activities are completed. The student's thesis advisor must indicate their continuing support for the student during this remediation process.

5) Failure. In exceptional circumstances the Committee may decide to assign a grade of "fail" without the opportunity for a re-examination. Upon receiving a recommendation that a student has failed, the GSBS Dean will review the events leading to it and take action to dismiss the student from GSBS.

At the end of the exam, the Committee Chair will inform the student of the Committee's recommendation from the options above. The General Examiner is charged with making sure that the scoring worksheet is completed. To facilitate student development and mentoring, students and their mentors will receive a copy of the scoring worksheet.

Forms: *On the day of the exam*, the exam outcome, including any revision, re-testing or remediation plan, should be reported to the GSBS office (through submission of Qualifying Exam Outcome form, completed by the Chair) along with the scoring worksheet.

In cases where revision, re-testing or a remediation plan are indicated, a subsequent Qualifying Exam Outcome form should be filed by the Chair when the requirements have been completed.

8. Next Steps. Complete the "Thesis Research Advisory Committee (TRAC) Selection Form". The TRAC consists of a chairperson, the thesis advisor, and 3-5 other faculty members. The TRAC reviews the student's progress annually and decides when the student is prepared to write the dissertation.

The student should also consider whether a revised version of the written Qualifying Exam can be submitted to funding agencies. In particular, NIH pre-doctoral "NRSA" fellowships are appropriate for students with US citizenship or a green card.

9. Timeline. A typical timeline for AY 2014-2015 (suggested... these are not deadlines):

Now	Work on identifying the problem; develop aims, approaches and abstract
By January 3	Identify > 4 QEC Candidates (General Examiner is assigned)
By January 10	Meet with Dave Weaver for Approval of Candidates
By January 17	Ask Committee members to participate. Schedule Abstract meeting.
February 16	Submit Abstract to Chair.
February 23	Chair or Student Distributes Abstract to Committee.
March 10	Abstract meeting. Schedule Oral Defense.
April 14	Written QE due 5 weeks after abstract approved.
April 21-24	Oral Defense / Exam

(if minor revisions or re-defense needed, they can be completed within ~ 3 weeks = May 15)

“F31 Instructions”

Excerpts from PHS SF 424 (R&R) Individual Fellowship Application Guide for NIH and AHQR
http://grants.nih.gov/grants/funding/424/SF424_RR_Guide_Fellowship_VerC.pdf

Table 2.6-1 Page Limitations and Content Requirements (Page I-28)

Research Training Plan	Text including all figures, charts, tables, and diagrams.
Specific Aims	1 page
Research Strategy	6 pages total

Instructions for Specific Aim Page: (Page I-103)

Specific Aims are limited to one page.

State concisely the goals of the proposed research and summarize the expected outcome(s), including the impact that the results of the proposed research will exert on the research field(s) involved.

List succinctly the specific objectives of the research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop new technology.

Instructions for Research Strategy (Page I-104-105)

Research Strategy is limited to six pages.

Organize the Research Strategy in the specified order using the instructions provided below. Start each section with the appropriate section heading — Significance, ~~Innovation~~, Approach. Cite published experimental details in the Research Strategy section and provide the full reference in the Bibliography and References Cited section ([Part I Section 4.4.9](#)).

(DRW: information about alternative page limits deleted: 6 page limit for QE's)

a. Significance

Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.

Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.

Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

~~**b. Innovation.** Fellowship applications should not include an Innovation section unless specified in the FOA.~~

c. Approach

Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. ~~Unless addressed separately in Item 14 (Resource Sharing Plan), include how the data will be collected, analyzed, and interpreted as well as any resource sharing plans as appropriate.~~

Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.

If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work.

(DRW deleted irrelevant info)

If an applicant has multiple Specific Aims, then the applicant may address Significance, Innovation and Approach for each Specific Aim individually, or may address Significance, Innovation and Approach for all of the Specific Aims collectively.

As applicable, also include the following information as part of the Research Strategy, keeping within the three sections listed above: Significance, Innovation, and Approach.

Preliminary Studies for New Applications.

For new applications, include information on preliminary studies, if any. Discuss the applicant's preliminary studies, data and/or experience pertinent to this application.

When applicable, provide a succinct account of published and unpublished results, indicating progress toward their achievement.

Bibliography & References Cited (page I-81)

Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application. ~~(DRW deleted info on PMID — not QE-relevant)~~

This section is required and should include any references cited in the PHS Fellowship Research Training Plan form.

The references should be limited to relevant and current literature. While there is not a page limitation, it is important to be concise and to select only those literature references pertinent to the proposed research.

Respective Contributions (page I-114)

This item is limited to one page.

Describe the collaborative process between you and your sponsor/co-sponsor in the development, review, and editing of this research training plan.

Font and Page Requirements (Page I-24)

Font. Prepare the application using **Arial, Helvetica, Palatino Linotype, or Georgia** typeface in black font color. After text attachments are converted to PDF, font size in each final PDF document must be at least **11 points (or larger)**. (A Symbol font may be used to insert Greek letters or special characters; the font size requirement still applies.)

(DRW deleted irrelevant text)

Paper Size and Page Margins. Final PDF documents should be formatted to be no larger than standard paper size (8 1/2" x 11). The final PDF document should have **at least one-half inch margins (top, bottom, left, and right) for all pages**. No information should appear in the margins, including the PI's name and page numbers.

FYI: What Criteria are used to evaluate an F31 NRSA application?

PHS SF 424 (R&R) Individual Fellowship Application Guide pages I-134 and I-135

Scored Review Criteria.

Reviewers will consider each of the five review criteria below in the determination of scientific and technical merit, and give a separate score for each.

The following review criteria are applicable to F31 and F32 applications. For review criteria pertaining to other individual fellowship applications (e.g., F05, F30, F33), please refer to the specific FOA.

Fellowship Applicant: Are the applicant's academic record and research experience of high quality? Does the applicant have the potential to develop as an independent and productive researcher in biomedical, behavioral or clinical science?

Sponsor(s), Collaborator(s), and Consultant(s): Are the sponsor(s) research qualifications (including successful competition for research support) and track record of mentoring appropriate for the proposed fellowship? Are there (1) evidence of a match between the research interests of the applicant and the sponsor (including an understanding of the applicant's research training needs) and (2) a demonstrated ability and commitment of the sponsor to assist in meeting these needs? Are the qualifications of any collaborator(s) and/or consultant(s), including their complementary expertise and previous experience in fostering the training of fellows, appropriate for the proposed research project?

Research Training Plan: Is the proposed research plan of high scientific quality, and does it relate to the applicant's training plan? Is the training plan consistent with the candidate's stage of research development? Will the research training plan provide the applicant with individualized and supervised experiences that will develop research skills needed for his/her independent and productive research career?

Training Potential: Does the proposed research training plan have the potential to provide the fellow with the requisite individualized and supervised experiences that will develop his/her research skills? Does the proposed research training have the potential to serve as a sound foundation that will lead the fellow to an independent and productive career?

Institutional Environment and Commitment to Training: Are the research facilities, resources (e.g. equipment, laboratory space, computer time, subject populations), and training opportunities adequate and appropriate? Is the institutional environment for the scientific development of the applicant of high quality, and is there appropriate institutional commitment to fostering the fellows' training as an independent and productive researcher?

This is the AY 2013-2014 QE scoring rubric, but it's likely AY 2014-2015 will be similar

GSBS QUALIFYING EXAMINATION PERFORMANCE ASSESSMENT			
<i>Student</i>		<i>Date</i>	
Background Knowledge			
Define area of study			
Recognize and explain broader significance of project			
Identify knowledge from other sources relevant to area of study			
Apply knowledge from relevant areas to proposed research			
Appraise strength of conclusions of relevant papers			
<i>Overall Knowledge Score</i>			
Hypothesis and Aims			Score
Identify the hypothesis to be tested			
Summarize evidence that supports proposed hypothesis			
Explain the significance of the hypothesis			
Evaluate alternative hypotheses with evidence-based argumentation			
Outline focused aims and relate them to the hypothesis			
<i>Overall Hypothesis and Aims Score</i>			
Experimental Approach			Score
Explain experimental design clearly and completely			
Identify assumptions in experimental plan			
Describe experiments that are feasible			
Appraise the quality of self-generated data (if applicable)			
Draw clear conclusions from experimental data			
Defend experimental rationale			
Relate all experiments directly to aims and hypothesis			
Predict an appropriate range of possible results			
Interpret potential outcomes of proposed experiments			
Propose alternative strategies			
<i>Overall Experimental Approach Score</i>			
Document Preparation and oral communication			Score
Communicate in clear, written English with proper grammar and word usage			
Compose document with minimal typographical and formatting errors			
Organize document in proposal format			
Present in clear spoken English			
Prepare high quality visual aids that clarify aims and approach			
Compose document with minimal typographical and formatting errors			
<i>Overall Presentation Score</i>			
FINAL OUTCOME (Pass; Provisional Pass; Revise; Retest; Fail)			
Scoring Rubric			
1 — Not performing. Student was unable to meet this objective			
2 — Developing. Student met this objective, but only with prompting			
3 — Achieving. Student met this objective without prompting			
4 — Excelling. Student showed unusual ability in meeting this objective			

Outcome of Exam
Pass - Student may enter into doctoral thesis research
Provisional Pass - Student may enter into doctoral thesis research but is required to take and pass the following course(s) with a grade of 'A', 'B', or 'P' the next time offered by GSBS. Required Course(s):
Not Passed – Revise - Student is required to revise the QE Proposal and may not enter into doctoral thesis research until the revisions have been approved by the committee
Not Passed - Retest - Student must retest and may not enter into doctoral thesis research until passing the retest. At the direction of the committee, this may require that the proposal be re-written.
Fail - Dismissed from GSBS

The final outcome should be selected from the range of outcomes currently used (see above), and should be a reflection of performance in each area, weighted as deemed appropriate by the committee (much like NIH study sections assign an overall impact score). A student who receives scores of 1 and 2 for all of the areas of assessment would Fail, whereas a student who receives scores of 3 or better for most the areas of assessment would Pass. A score of 2 in any individual assessment area, while acceptable, informs the student, mentor, and future TRAC of the need for improvement, and that developmental progress in those areas should be assessed by the TRAC. The worksheet is not intended to eliminate subjectivity; rather, it is offered as an aid to the QE committee for identifying student strengths and weakness and for focusing discussion of student performance on uniform criteria. The completed worksheet serves as a record of the exam and is submitted to the GSBS office for inclusion in the student's permanent record and also to the student's thesis advisor.

One member of every QE committee will be chosen from a pool of experienced, senior faculty. Previously, GSBS standards required that at least one member of the QE committee be an "outside member". Most programs are now interdepartmental, and many faculty are affiliated with multiple programs thereby blurring the definition of outside member. The original purpose for this requirement was to provide quality control and uniformity in QE standards across programs. GSBS Assembly has approved reinstatement of the outside member requirement but in a form consistent with present operation of the GSBS. The GSBS Dean will recruit and appoint several senior faculty members to fulfill this role each year. These faculty will be designated "General Examiners" (GE). The most important qualification for GE would be experience in graduate student training. The number of GE's will be determined by the number QE's to be administered that year, with the intention that each GE sit on 2-3 QE's per year. Ideally GE's would serve for more than one year with only 1/2 to 1/3 of GE's being replaced each year.

The GE has equal standing to other members of the QE, but cannot be the Chair and will not assume the roles and functions assigned to the Chair. The Chair will continue to be responsible for informing the student of exam procedure, communicating relevant details of the student's academic record to the committee as a whole, insuring fair treatment of the student during the exam, leading the committee's deliberation to determine exam outcome, and communicating the outcome to the student and the GSBS Office. The role of the GE would be to lend his/her experience to the committee as a whole, with special emphasis on "big picture" aspects. *In particular, the primary responsibilities of the GE would be to ensure that student assessment be based on the defined*

learning objectives and that final determination of pass/fail be consistent with other QE's. Accordingly, the GE need not be an expert on the subject of the qualify exam proposal.

The roster of GEs will be determined by the Dean in consultation with the Program Directors, and will be assigned to each QEC by the Dean in consultation with the Program Directors. Selection and assignments are made during the Fall semester to facilitate committee selection and scheduling. An annual orientation will outline GE responsibilities and standards for the QE. Subsequent annual orientation sessions will include an evaluation by returning GEs of the strengths and weakness of the mechanism for ensuring that student assessment is based on defined standards that extend across all graduate programs.

The role of General Examiner will be added to institutional Educational Effort calculations to ensure that the role and time commitment of the GEs are appropriately recognized. GSBS Assembly understands that most QE's are uniformly administered and that outcomes are consistent with the expectations of the majority of GSBS faculty. For that reason, it is anticipated that GE participation in the QE will be little different from that of the other members. In exceptional cases, however, the GE may have to act as a student advocate, or conversely, have to remind the committee of GSBS expectations for student performance. In either case, it is imperative the GE feel free to state his/her position; therefore, the Standards Committee recommends all GEs are tenured. The GE's vote is equal to that of the other members.