




MEMORANDUM

To: Julio Frenk, President

From: Tomás A. Salerno
Chair, Faculty Senate 

Date: November 21, 2018

Subject: Faculty Senate Legislation #2018-30(B) – Proposal to Change the Format of the PhD Qualifying Examination in Biomedical Engineering, College of Engineering

The Faculty Senate, at its November 14, 2018 meeting, voted unanimously to approve the proposal from the College of Engineering to change the format of the PhD qualifying examination in Biomedical Engineering. The College proposes to change the current format of the PhD qualifying exam from written, as is normally required under the current Graduate School policy, to oral.

The proposed changes do not require approval by SACSCOC.

The Faculty Senate does not approve budget concepts, therefore no budget information is included here.


This legislation is now forwarded to you for your action.

TAS/rh

Enclosure

cc: Jeffrey Duerk, Provost and Executive Vice President for Academic Affairs
Guillermo Prado, Dean of the Graduate School
Jean-Pierre Bardet, Dean of the College of Engineering
Noel Ziebarth, Associate Professor and Graduate Program Director, Biomedical Engineering, College of Engineering

CAPSULE: Proposal to Change the Format of the PhD Qualifying Examination in Biomedical Engineering, College of Engineering

APPROVED:  DATE: 12/19/18
(President's Signature)

OFFICE OR INDIVIDUAL TO IMPLEMENT: Dean Jean-Pierre Bardet

EFFECTIVE DATE OF LEGISLATION: IMMEDIATELY
(if other than June 1 next following)

NOT APPROVED AND REFERRED TO: _____

REMARKS (IF NOT APPROVED): _____



**UNIVERSITY
OF MIAMI**

Proposal Submission Checklist

Proposals are to be submitted to the Office of Assessment and Accreditation (OAA), if applicable, the Graduate Council (for graduate programs excluding Law and Medical), if applicable, and the Faculty Senate. Refer to the [Procedures for Program Changes](#) document for information on the approvals and notifications needed for program changes and the [Proposal Submissions Specifications](#) document for an explanation of the process and a list of the materials required.

(Please note that change approvals can take 2 semesters to complete.)

Include this checklist at the beginning of each proposal.

(Complete the information below, save the form as a pdf, and insert it with the background materials that are specified, in the order listed, and send the package electronically as noted above.)

KEY CONTACT PERSONNEL INFORMATION

First Name

Noel

Last Name

Ziebarth

Proponent's Title

Associate Professor and Graduate
Program Director

Department, if applicable

Biomedical Engineering

School/College

College of Engineering

E-mail

nziebarth@miami.edu

Phone

(305) 284-4520

Title of Proposal

Proposal to Change the Format of the PhD Qualifying Examination in Biomedical Engineering

(-continue to next page-)

MANDATORY MEMORANDA AND FORMAT

Please check that each item listed below is included in the proposal package of materials, in the ORDER as listed. The applicable title (i.e. Letter of Explanation, Memo from the Dean, etc.) is to precede each section in the materials.

Only proposals conforming to this format will be accepted.

1. This completed checklist.

2. Letter of explanation. (2-3 pages only, double spaced, 12 pt font)

Yes No

If no, explain why:

3. A memo from the dean(s) signifying approval of the faculty of the relevant School(s) / Colleges(s).

Yes No

If no, explain why:

The College of Engineering faculty annually votes to delegate voting right authority to the College Council. College Council approved the proposal (see #4 and associated memo).

4. A memo that all affected or relevant School / College Council(s) have approved.

Yes No

If no, explain why:

5. A memo from the department chair(s) signifying approval of the faculty of the relevant department(s).

Yes No

If no, explain why:

6. A memo from the Office of Accreditation and Assessment (OAA) if the proposal involves academic programs (degrees, certificates, majors, minors, concentrations, specializations, tracks, etc.) such as new programs, closing programs, or program changes (such as changes in requirements, program length, modality, name, location).

(To be submitted by OAA to the Graduate Council or the Faculty Senate, as appropriate.)

Applicable Not applicable.

If not, explain why:

We contacted Patty Murphy via email regarding our proposal, and she replied that the proposed change does not require SACSCOC approval. Her email is attached.

7. A memo from the Graduate School Dean signifying approval of the Graduate Council (for graduate programs only).

(To be submitted to the Faculty Senate by the Graduate Council.)

Applicable Not applicable.

If not, explain why:

8. Academic Deans Policy Council (ADPC) approval, for interdisciplinary issues and as appropriate. Please consult with the Dean of the Graduate School or the Secretary of the Faculty Senate to check if this is needed.

Yes No

If no, explain why:

No interdisciplinary issues.

9. Additional required documents as listed on the "Proposal Submissions Specifications," i.e. market analysis, budget information, assessment of library collections, etc. as specified.

List additional documents included:

None

FORM INSTRUCTIONS:

1. Once you have completed the form, save it to your computer by clicking the "Save" button below.
2. Print and scan it.
3. Submit the scanned version to facsen@miami.edu with your proposal. **Please note:** only scanned versions can be accepted.

Save

End form.

COLLEGE OF ENGINEERING
Department of Biomedical Engineering

Proposal to Change the Format of the PhD Qualifying Examination

BACKGROUND AND RATIONALE:

In response to recommendations received from our external graduate program review committee, a special committee was formed in the Department of Biomedical Engineering to develop a proposal for a new format of the PhD qualifying examination. The current qualifying examination includes two steps: a written examination covering basic physiology, mathematics, and engineering concepts (qualifying screening examination) and an oral presentation of the dissertation proposal. Following successful completion of both the written examination and the oral defense of the dissertation proposal, the student is admitted to candidacy.

The special committee performed a benchmark analysis of the PhD qualifying examination format at several aspirational peers and top-ranked graduate programs, including Berkeley, Duke, Georgia Tech, Boston University, Case Western, University of Rochester, Vanderbilt, and Northwestern (see Appendix 1). Of the 15 Universities included in the benchmark analysis, nine had some form of an oral qualifying examination and an additional three had no qualifying examination at all. Therefore, the committee proposed to replace the current format written examination with an oral qualifying examination. The dissertation proposal will be completely separate from the qualifying examination. The proposed new format has been approved by the Department of Biomedical Engineering faculty, the College of Engineering Council, and the Graduate School Council.

PROPOSED IMPLEMENTATION:

Qualifying examination committee

The qualifying examination committee will consist of at least 3 tenured or tenure-track primary faculty in the Department of Biomedical Engineering. For each student, the committee members will be selected based on their research area, for example:

- Biomechanics: Huang, Jackson, Ziebarth
- Neural engineering: Bohorquez, Dumont, Ozdamar, Prasad, Rajguru
- Optics and imaging: Manns, Zhao, Ziebarth, Rajguru
- Tissue engineering/Biomaterials: Agarwal, Andreopoulos, Cheung, Dumont, Tomei

The research mentor will NOT be a member of the qualifying examination committee for his/her students to avoid bias. At least one additional tenured, primary BME faculty member who is not part of the committee will serve as neutral observer. The observer will ensure that the examination follows the required standards and will help resolve any conflicts that may arise.

Required areas of knowledge

The examination will be administered at the beginning of the third semester that a student is enrolled in the PhD committee. Prior to this, the qualifying examination committee members will develop a list of required areas of knowledge for each student. This list will include engineering, physiology, and experimental design topics relevant to the broad research area of each student. The list of topics will be reviewed by the Graduate Program Director and then given to the student at least 3 months before the oral examination. International students will be informed that

this oral qualifying examination is not an English fluency examination; rather, it is a test of their knowledge in their selected area of research.

Day of the examination

The oral qualifying examination will start with a short presentation by the student describing the background and significance and general goals of the proposed research. After the presentation, the committee will assess the student's grasp of the scientific principles underlying the proposed research area and the significance of the project. The qualifying examination committee will pose questions related to the topic areas that were given to the student prior to the examination. The oral qualifying examination will be closed to the public. The entire examination, including the deliberation period of the qualifying examination committee, will be recorded and the recording will be stored in a secured database for a period of 5 years or until the student graduates from the program, whichever comes first.

Criteria for passing

After the oral examination, the student's qualifying examination committee will deliberate and determine one of the following outcomes of the examination:

1. Unconditional pass
2. Conditional pass: the exact terms of the conditions will be included in a letter to the student from the Graduate Program Director – i.e., what additional course(s) need be taken; in what time frame the condition(s) should be met; and any other pertinent information that will point out clearly to both the student and faculty how to satisfy the condition(s). As soon as all conditions have been met, the qualifying examination committee will prepare a letter to the Graduate Program Director informing him/her that the condition has been removed.
3. Fail: re-examine the candidate by the same committee within 3 months. The candidate must receive a Pass or Conditional Pass on the second attempt. A second failure will lead to dismissal from the program.

Students must demonstrate proficiency in the following areas to receive either an unconditional or conditional pass:

- Breadth and depth of advanced biological knowledge
 - o Explains the biological system at the structural level
 - o Provides details with minimal prompting
- Breadth and depth of advanced engineering skills
 - o Provides general details of relevant engineering principles
 - o Understands appropriate engineering approach to solve a problem
- Integration of biological and engineering concepts in solving complex biomedical problems
 - o Explains biological phenomena using engineering terminology
 - o Develops and explains an experimental design
- Ability to read, analyze, and synthesize relevant literature
 - o Recognizes errors and limitations of previous studies
 - o Makes objective interpretations of data
 - o Is familiar with the key prior studies and current work in chosen field of study

Appendix 1: Review of Qualifying/Screening Examination at Other Universities

University	Policy
Boston University*	Oral exam covering a core area and breadth area
Case Western Reserve*	Oral exam based on the core BME curriculum, asked in the context of the students' research.
Duke University*	Oral exam covering basic knowledge and understanding of research.
Georgia Tech	Oral exam where each exam committee member has the opportunity to ask fundamental bioscience and engineering questions related to the students' research; oral exam part of dissertation proposal
Johns Hopkins University	Oral exam covering course work that the student has completed
Massachusetts Institute of Technology	Written exam with questions focusing on material from each of the core subjects.
North Carolina State University	Four independent written exams given over a period of 18 months.
Northwestern University*	Written exam only required if grade of A- received in any courses
Rice University*	No written or oral exam separate from dissertation proposal
University of California at Berkeley	Oral presentation of research project, but in-depth questions probing the student's grasp of the basic challenges and principles underlying the project are included; oral exam part of dissertation proposal
University of Florida	Critical analysis of 3 peer-reviewed research articles including oral presentation with questions on the articles and a written critical review.
University of Pennsylvania*	Orally defend 6 page NIH style proposal separate from thesis in front of committee
University of Rochester*	No written or oral exam separate from dissertation proposal
Stanford University	Oral exam testing four core areas.
Vanderbilt University*	No written or oral exam separate from dissertation proposal

* indicates aspirational peer university

UNIVERSITY OF MIAMI
COLLEGE of ENGINEERING



MEMORANDUM

DATE: October 24, 2018

TO: Faculty Senate

FROM: Dr. GeCheng Zha
Council Speaker
College of Engineering Council

SUBJECT: Biomedical Engineering (BME) Department Request to change PhD Qualifying Exam

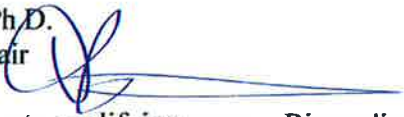
On Monday, October 1, 2018, the College Council of Engineering voted to approve the proposal to replace the written qualifying examination with an oral examination for the Biomedical Engineering PhD program.

UNIVERSITY OF MIAMI
COLLEGE of ENGINEERING



Biomedical Engineering Department
P.O. Box 248294
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Fax: 305-284-6494
www.miami.edu/bme

Date: October 24, 2018
To: Tomas Salerno, M.D.
Chair, Faculty Senate
From: Fabrice Manns, Ph.D.
Professor and Chair 
Subject: Proposal – Change to qualifying exam – Biomedical Engineering

On August 24, 2018, the biomedical engineering faculty voted and approved to adopt an oral format for the biomedical engineering qualifying examination.

If you have any questions, please feel free to contact me.

Ziebarth, Noel Marysa

From: Murphy, Patty
Sent: Monday, September 17, 2018 2:37 PM
To: Ziebarth, Noel Marysa
Subject: Re: PhD qualifying exam, biomedical engineering

Hi Noel. Sorry for the delay in responding. This change would not require SACSCOC approval.

Patty

From: "Ziebarth, Noel Marysa" <nziebarth@miami.edu>
Date: Tuesday, September 11, 2018 at 2:34 PM
To: "Murphy, Patty" <pattymurphy@miami.edu>
Subject: PhD qualifying exam, biomedical engineering

Dear Patty,

I am the Graduate Program Director in the Department of Biomedical Engineering. I have been in contact with Tiffany Plantan at the Graduate School about some changes we would like to implement in our PhD qualifying exam procedure. Tiffany suggested that I reach out to you to see if anything is needed by your office.

The current Graduate School policy for the qualifying exam states the following: "A written qualifying examination is to be taken by each doctoral degree candidate in all doctoral programs, with the exception of Physical Therapy, at the time that the student and the supervisory committee deem appropriate. The major program may specify that its students must take an oral examination as well. In those cases, normally, the student shall pass the written examination before the oral examination is conducted."

In Biomedical Engineering, we currently administer a 3 part written qualifying exam that tests basic knowledge in math, physiology, and engineering. We performed a benchmark analysis of the qualifying exam procedure at our aspirational peer universities, and most universities actually administer an oral exam instead of a written exam. Because of this, our department faculty recently voted to replace our written exam with an oral exam.

Since an oral exam would differ from the official Graduate School policy, this change needs to be approved by the Engineering Council and the Graduate Council. I already scheduled these meetings. However, I'm not sure if there are any accreditation issues that we also need to address.

I appreciate your guidance.

Best,
Noel

Noël Ziebarth, Ph.D.
Associate Professor
Graduate Program Director
Department of Biomedical Engineering

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COLLEGE of ENGINEERING



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MEMORANDUM

DATE: October 23, 2018

TO: Tomas Salerno
Chair, Faculty Senate

FROM: Guillermo (Willy) Prado *Guillermo Prado*
Dean, The Graduate School

SUBJECT: Proposal – Change to qualifying exam – Biomedical Engineering

The Department of Biomedical Engineering submitted a proposal to change the qualifying exam from a written format to an oral format. The proposal was discussed at the meeting of the Graduate Council on Tuesday, October 16, 2018, and was conditionally approved pending the integration of the following recommendations into the standard operating procedures for the administration of the oral exam:

- Audio record the oral exam
- Include criteria of what is considered passing
- Conflict resolution – a neutral person should be present during the oral exam
- Language barrier concern – international students should be informed that the oral exam is not an English fluency exam

cc: Jean-Pierre Bardet, Dean, College of Engineering
Noel Ziebarth, Graduate Program Director, Dept. of Biomedical Engineering
Office of Assessment and Accreditation