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## 2018 BMMB Orientation Schedule

- Monday, August 13<sup>th</sup>      BMMB Orientation with Dr. Giebink (**mandatory**)  
3:30pm-5:00 pm, 301D Huck Life Sciences Building
- Welcome Party with BMMB Graduate Student Association and Peer Mentors  
5:00pm, Fishbowl (Frear Lobby)
- Tuesday, August 14<sup>th</sup>      Student Advising with Dr. Ken Keiler (**mandatory**)  
9:00am-12:00pm (as scheduled)
- Radionuclide Training Session (**mandatory**)  
1:30pm-2:30pm, 229 Academic Projects Building
- Bowling Night with Graduate Students  
7:00pm, Northland Bowl  
Carpool leaves campus at 6:45pm from parking lot between Frear and Osmond
- Wednesday, August 15<sup>th</sup>      Laboratory Safety Training (**mandatory**)  
10:30am-11:15am, 100 Huck Life Sciences Building (Berg Auditorium)
- Monthly Graduate Student Coffee Hour with Welcome Pizza Party  
11:30am-1:00pm, 4<sup>th</sup> Floor North Frear Lunch Space
- Graduate School Orientation and Reception (**mandatory**)  
1:00pm-6:00pm, Bryce Jordan Center
- Thursday, August 16<sup>th</sup>      Nothing scheduled. Enjoy a free day.
- Friday, August 17<sup>th</sup>      BMB Welcome Picnic  
3:00-5:00pm, 3<sup>rd</sup> Floor Bridge between Chemistry and Huck Life Sciences
- Evening Social Event with BMMB graduate students  
6:00pm, Downtown State College
- Saturday, August 18<sup>th</sup>      11am, Annual BMMB Hike up Mount Nittany  
Carpool leaves campus at 10:45am from parking lot between Frear and Osmond
- Monday, August 20<sup>th</sup>      Classes and First Laboratory Rotation Period Begins

## BMMB Graduate Student Timeline

### Fall 1<sup>st</sup> Year

**Status: Teaching Assistantship (TA)**

BMMB 501 – Core Concepts in Biomolecular Science  
BMMB 507 – Seminar in BMMB (includes formal evaluation of English speaking competency)  
BMMB 509 – Ethics in Biomedical Science  
BMMB 602 – Orientation and TA training  
BMMB 600 – Laboratory Rotations

### Spring 1<sup>st</sup> Year

**Status: Teaching Assistantship (TA)**

BMMB 502 – Critical Analysis of the Biochemical, Microbial, and Molecular Biology Scientific Literature  
BMMB 602 – Teaching assignment (unless still taking ESL [English as a Second Language] courses)  
BMMB 600 – Dissertation Research or additional Laboratory Rotations (if needed)  
1 - 2 Elective Lecture Courses  
ESL courses or remediation if needed after initial English speaking competency assessment

### Summer 1<sup>st</sup> Year

**Status: Teaching Assistantship (TA)**

Write Research Summary for Oral Qualifying Examination  
ESL courses or remediation if needed after initial English speaking competency assessment

### Fall 2<sup>nd</sup> Year

**Status: Teaching Assistantship (TA)**

1 to 2 Elective Lecture Courses  
BMMB 602 – Teaching assignment  
BMMB 600 – Dissertation Research  
Oral Qualifying Examination (individually scheduled) – will include formal evaluation of written English competency and evaluation of oral English competency if deemed unsatisfactory in BMMB 507 (2<sup>nd</sup> and last chance of meeting oral English competency requirement)

### Spring 2<sup>nd</sup> Year

**Status: Research Assistantship (RA)**

Lecture courses, as necessary (to finish credit requirements) or if desired  
Teaching assignment if still on a teaching assistantship or if have not yet taught twice  
Dissertation Committee must be formed by February 15<sup>th</sup>  
Comprehensive Examination may be taken starting this semester  
Dissertation Research

### Summer 2<sup>nd</sup> Year

**Status: Research Assistantship (RA)**

Essay for formal evaluation of written English competency for those students who have not yet satisfied the requirement (last chance)  
Comprehensive Examination may be taken this semester  
Dissertation Research

### Fall 3<sup>rd</sup> Year

**Status: Research Assistantship (RA)**

Lecture Courses, as necessary or if desired  
Teaching assignment if still on a teaching assistantship or if have not yet taught twice  
Comprehensive Examination must be taken by the end of this semester  
Dissertation Research

### Spring 3<sup>rd</sup> Year

**Status: Research Assistantship (RA)**

Comprehensive Examination must be taken by the end of this semester

### Each semester thereafter

**Status: Research Assistantship (RA)**

Dissertation Research  
Teaching assignment if still on a teaching assistantship

## Graduate Program Administration

Dr. Ken Keiler, Associate Department Head for Graduate Education  
Dr. Lorraine Santy, Graduate Program Liaison Officer  
Dr. Heather Giebink, Director of Graduate Affairs  
Ms. Linda Kunes, Graduate Program Coordinator

kck11@psu.edu  
lcs13@psu.edu  
hug14@psu.edu  
ljk4@psu.edu

### **Graduate Program Policy Statement (effective August 2018) Biochemistry, Microbiology and Molecular Biology (BMMB)**

The following constitutes the policies, procedures, and requirements for the student's course of study in BMMB. The successful completion, defense, and publication of an original research project are the most important components of the Ph.D. program. Additionally, BMMB and the Graduate School require that students meet certain residency requirements, maintain satisfactory scholastic performance, demonstrate mastery of the English language, and successfully pass qualifying, comprehensive, and final oral examinations. The following information is provided to help you navigate BMMB requirements; however, you should consult the *Graduate Degree Programs Bulletin* for further details (<http://bulletins.psu.edu/bulletins/whitebook/>). Additional BMMB policies can be found in the "BMMB Graduate Program" Canvas group.

#### **Doctoral Degree Requirements and Procedures**

##### **I. Laboratory Rotations and selection of Dissertation Advisor**

The Associate Department Head for Graduate Education, Dr. Ken Keiler, is in charge of advising students about academic and related matters until they have chosen a dissertation research advisor. The dissertation research advisor must be a member of the BMMB graduate faculty. To help students learn about faculty research, each student undergoes laboratory rotations doing experimental projects in at least three faculty laboratories before deciding on their research area. Students generally select their dissertation research advisor at the end of their first semester. The selection process requires that there be a mutual acceptance by both the student and the faculty member. Students should only consider laboratories that have open positions for new graduate students. Openings in laboratories vary depending on available funding and space in a particular laboratory.

Placement for the first rotation will occur following the initial advising session during the week before classes begin. Although the first rotation is assigned by the Associate Department Head for Graduate Education, every effort will be made to allow students to rotate in their preferred laboratories. To facilitate placement for the first rotation period, incoming students are encouraged to communicate with faculty members who are accepting new students prior to their arrival in August. If a rotation agreement is reached prior to the advising session, that agreement will specify the first rotation assignment.

Placement for the second and third rotations will be determined as follows. Students should schedule an appointment to speak with each faculty member that they may want to rotate with. These meetings should be completed within the first four weeks of the first rotation period. Faculty will sign a form specifying that they agree to have the student rotate in the second or third rotation period. These forms should be turned into the Director of Graduate Affairs (Heather Giebink) at least one week before the second rotation begins.

Final lab placement following rotations is a mutual decision made between a student and a faculty member. At the end of the 3<sup>rd</sup> rotation period, a student should meet with a prospective faculty mentor and if both parties agree, both the student and the faculty will sign the same form indicating that they have agreed on a permanent lab assignment. The signed document is returned to the Director of Graduate Affairs. Permanent lab assignments are subject to approval of the BMB Department Head. Students that have not identified a dissertation research advisor at the end of the 3<sup>rd</sup> rotation period are directed to meet with additional prospective faculty mentors to arrange for rotations during spring semester. If the student is unable to obtain a dissertation research advisor by the end of the spring semester, the student will no longer be enrolled in the BMMB graduate program.

*Note: While formal lab assignments are not made until the end of the 3<sup>rd</sup> rotation period, students and faculty are encouraged to meet at the end of each rotation to discuss impressions of the rotation, strengths and weaknesses of the rotation, and interest in joining the laboratory. BMMB students are reminded that there may be graduate students from other programs also competing for the same laboratory slots.*

### **2018-2019 Rotation Schedules**

Rotation Period 1: August 20-September 21

Rotation Period 2: September 24-October 26

Rotation Period 3: October 29-December 7 (includes Thanksgiving break)

Rotation Period 4: January 7-February 8

Rotation Period 5: February 11-March 15 (includes Spring break)

Rotation Period 6: March 18-April 19

### **BMMB Faculty Accepting Rotation Students**

Dr. Lu Bai

Drs. Marty Bollinger/Carsten Krebs

Dr. Squire Booker

Dr. Frank Dorman

Dr. Santhosh Girirajan\*

Dr. Ying Gu

Dr. Wendy Hanna-Rose

Dr. Joyce Jose\*

Dr. Ken Keiler

Dr. Scott Lindner

Dr. Shaun Mahony\*

Dr. Tim Miyashiro

Dr. Katsu Murakami\*

Dr. Andrew Patterson

Dr. Gary Perdew

Dr. Frank Pugh

Dr. Joseph Reese

Dr. Moriah Szpara\*

Dr. Song Tan

\*These faculty members will only be taking students for the 2<sup>nd</sup> and 3<sup>rd</sup> rotation period

Several of the faculty who are accepting new students will give 15-minute research presentations. Your attendance at these presentations is required. Some of the faculty listed above will not be giving talks, however they are interested in taking new graduate students and are therefore available for individual appointments to discuss their research.

## **II. Coursework and Curriculum**

Graduate work in BMMB combines the rigor of advanced study with the flexibility for students to design their own optimum curriculum in consultation with their advisor and dissertation committee. Formal coursework required of BMMB graduate students includes:

BMMB 501 (5 credits) - Core Concepts in Biomolecular Science

BMMB 502 (1 credit) - Critical Analysis of Biochemical, Microbial, and Molecular Biology Scientific Literature

BMMB 507 (2 credits) - Seminar in Biochemistry, Microbiology, and Molecular Biology

BMMB 509 (1 credit) - Ethics in Biomedical Science

The BMMB graduate program requires 19 credits of graduate coursework, therefore an additional 10 credits of non-seminar, non-journal club elective courses at the 400, 500 or 800 level must be taken (6 of these credits must be at the 500 or 800 level). These electives are generally chosen from among BMMB, BMB, and Microbiology courses. Students may take courses in other areas relevant to their dissertation research. Chemistry and Statistics are the departments offering additional graduate electives most commonly taken by BMMB students. Undergraduate courses at the 400 level may also be taken. Final approval for coursework is the responsibility of the Ph.D. committee at the time of the comprehensive exam.

To assist with planning your coursework, please see the sample class schedule for a BMMB student and a blank copy in the appendix.

### **III. Continuous Enrollment and Scheduling Using LionPATH**

Penn State uses a student information system called LIONPATH. Students use LionPATH to schedule courses, view and pay tuition bills, manage student milestones, and activate intent to graduate. ([www.lionpath.psu.edu](http://www.lionpath.psu.edu)).

Penn State requires graduate students to be continually enrolled while working towards their degree. This means students will need to register for classes every fall and spring. Students will only register for classes in the summer when needed. Registration opens in LionPATH at different times depending on student status.

#### Registration Dates Fall 2018

Open: 3/21 (36+ credits), 3/23 (20-35 credits), 3/26 (0-19 credits)

Last day to register: 8/19

#### Registration Dates Spring 2019

Open: 10/10 (36+ credits), 10/12 (20-35 credits), 10/15 (0-19 credits)

Last day to register: 1/6

#### Instructions for how to register using LionPATH

[http://www.registrar.psu.edu/registration/adding\\_courses.cfm](http://www.registrar.psu.edu/registration/adding_courses.cfm)

<https://www.registrar.psu.edu/lionpath/knowledge-center/registration-faqs.cfm>

#### Pre-Registration Activity Guide and Financial Responsibility Agreement

In order to register students must complete the "Pre-Registration Activity Guide" and "Financial Responsibility Agree" every semester.

### **IV. Tuition Bills**

Students on a Penn State administered assistantship, fellowship or training grant will have their tuition automatically paid by the appropriate fund. Students do not need to do anything in LionPATH.

Students on an external fellowship or scholarship will need to verify whether the agency will be paying Penn State directly, or if they will be sending the student a check. If they are sending the student a check, then the student will need to pay their bill directly to the bursar's.

Questions regarding funding status or tuition payments should be directed to Linda Kunes ([lj4@psu.edu](mailto:lj4@psu.edu)).

### **V. Student Healthcare**

All students on an assistantship or Penn State fellowship are automatically enrolled in Penn State's Student Health Insurance Plan. Penn State provides an 80% health insurance subsidy to all students while on an assistantship or fellowship. Graduate students may elect to decline the Penn State plan; however, international students are required to show proof of additional insurance. Students may add dependents and add optional dental and vision coverage as well. Please see the Student Health Insurance website for more information.

<https://studentaffairs.psu.edu/health-wellness/health-insurance>

### **VI. BMMB Teaching Training and Experience**

Teaching is an essential component of graduate education. Knowledge must be passed on to future students to continue the progress of science. Published studies also indicate that teaching experiences contribute to the improvement of essential research skills (Science 19 Aug 2011: Vol 333, Issue 6045, pp. 1037-1039).

Additionally, the communication and organizational skills gained during your teaching experiences will provide you with competitive advantages in your professional development and success as scientists beyond Penn State. Therefore, teaching is an integral part of our Ph.D. training program.

Upon graduation BMMB expects that our students will:

- Understand and use evidence-based teaching strategies in the classroom.
- Demonstrate the ability to convey key scientific concepts efficiently and clearly to a novice audience.
- Create learning objectives and aligned formative and summative assessments to measure learning outcomes.
- Appreciate and demonstrate key aspects of inclusivity in the classroom.

### **BMMB Requirements**

Course: BMMB students will complete a TA training module during the fall semester of their first year. Students will be introduced to evidenced-based teaching strategies and the principles of pedagogy.

Supervised Teaching Experience: BMMB students are required to act as teaching assistants for two semesters during their graduate career. The teaching experience involves assisting a faculty member in teaching an undergraduate laboratory course. The teaching assistant leads a group of undergraduates through the completion of their assigned experiments, develops and evaluates assessments, laboratory preparation, and presents lectures.

### **Timing of the Teaching Experience**

All students are required to teach one formal undergraduate laboratory course during each of the first two academic years. Most often, students will teach during the spring semester of their first year and the fall semester of their second year.

### **Teaching Workload**

Students are required to satisfy one of the following teaching workloads in BMMB:

- 2 sections of a 100 level laboratory course per semester
- 1 section of a 200 level laboratory course per semester
- 1 section of a 400 level laboratory course per semester

The assignments have been judged by instructors to involve similar time requirements, which should not exceed an average of 20 hours per week per semester for the course. The assignments will be subject to periodic evaluation to ensure that these assignments place similar workloads on TAs.

Additionally, students are to register for 1 credit hour of BMMB 602 (Supervised Experience in College Teaching) each of the first two times that teaching duties are assigned. Students will receive a letter grade based on their teaching performance. Successful completion (a grade of B or higher) of 2 semesters of BMMB 602 satisfies one component of the Graduate School Teaching certificate, which students have the option of pursuing. (<http://www.gradschool.psu.edu/index.cfm/current-students/tacert/>)

## **VII. Annual Graduate Student Activity Reports**

The Graduate Student Activity Report (GSAR) is a college-wide system designed to improve graduate student advising and mentoring. All BMMB students and faculty are required to use this system to provide an annual student evaluation, as well as to document the required annual committee meeting. This system allows students, advisers, and committee members to readily assess the current and past progress of students, as the website will be available at all times. The link to the GSAR is: [https://apps.science.psu.edu/grad\\_activity/](https://apps.science.psu.edu/grad_activity/)

GSARs must be completed and approved for all BMMB graduate students by August of each academic year. The report is open from September - August for each academic year. There are different workflows/procedures depending on the completed milestones of the students.

Final deadlines for submission for the 2018-2019 academic year

- **July 1:** Deadline for student input of initial information.
- **July 22:** Deadline for committee member/adviser comments following the annual committee meeting.
- **August 2:** Deadline for student acknowledgment.
- **August 16:** Deadline for confirmation by adviser
- **August 30:** Deadline for approval by Graduate Program

### VIII. Annual Advising Experience Feedback

The most important relationship in a graduate student's Ph.D. training is that between the student and their mentor. Eberly College of Science and BMMB are committed to providing, promoting, and recognizing excellence in mentoring.

Eberly College of Science has developed an online "Advising Experience Feedback Form" that has both a confidential and non-confidential portion. Students will have access to the form once their Graduate Student Activity Report (GSAR) has been approved by the Graduate Program. Students may choose to complete only the confidential portion or the non-confidential portion, or both. Students may also choose to not complete the form.

**Non-confidential (first part of form):** Adviser can see all comments entered here. BMMB Graduate Program, Department Head, and Eberly College of Science can also access this form.

**Confidential (second part of form):** The student selects who can see feedback provided in this section. Options are as follows:

Aleksandra Slavkovic (Associate Dean for Graduate Education)  
 Wendy Hanna-Rose (BMB Department Head)  
 Ken Keiler (Associate Department Head for Graduate Education)  
 Lorraine Santy (BMMB Liaison Officer)  
 Ola Sodeinde (BMB Ombudsman)  
 Maria Krasilnikova (BMB Ombudsman)

### IX. Required Annual Trainings

**Laboratory Safety and Radionuclide Safety:** All BMMB students take the required initial Laboratory Safety and Radionuclide Safety courses during orientation week. If you have missed this training, please sign up for an upcoming training session through the Environmental Health and Safety Office.  
[https://apps.opp.psu.edu/ehs\\_training/course\\_list.cfm](https://apps.opp.psu.edu/ehs_training/course_list.cfm)

**Laboratory Safety Refresher:** All BMMB students must complete the "Laboratory Safety Refresher Training" each year. A copy of your certificate must be given to your laboratory's waste management logbook and any other locations your laboratory specifies.

**Annual Compliance Training:** This training is required annually and provides an overview of ethics and compliance obligations at Penn State. It covers a number of ethics and compliance topics, including conflict of interest, gifts and entertainment, discrimination, and sexual misconduct. It also addresses resources for reporting misconduct and anti-retaliation policies. Training is available online through the Learning Resource Network Site.

**Understanding Title IX at Penn State:** Understanding Title IX at Penn State is an online training module that has been designed to ensure that all Penn State employees, graduate assistants, and those with graduate fellowships understand the applicable laws and University policies related to issues of sexual and/or gender-based harassment and misconduct, are cognizant of their responsibilities to report such incidents to the University's Title IX Coordinator, and are aware of how to make a report, if the need should arise. Training is available online through the Learning Resource Network Site.

**Reporting Child Abuse Training:** All BMMB students are required to complete Reporting Child Abuse training annually. Please complete the training and keep a copy of your certificate. Failure to comply with this requirement may lead to a loss of funding. Training is available online through the Learning Resource Network Site.

**Learning Resource Network Site:** <http://lrn.psu.edu/>

## X. Qualifying Examination Overview

The BMMB Graduate Program administers an oral qualifying examination to assess whether the student is capable of conducting graduate research based on evidence of critical thinking skills, understanding of the scientific method, and knowledge of relevant subject matter. This two-hour oral examination will be based on a recent paper from the research literature and a two-page summary of the student's own research project. All examinations will take place during the fall semester of the second year. In addition to passing the oral qualifying examination, students must display excellence in coursework, research and teaching to be eligible to take the comprehensive examination.

*A separate qualifying examination policy statement describes in detail the procedures for administering and assessing the qualifying examination. A separate English proficiency requirement statement describes the relevant procedures for meeting that requirement in detail.*

## XI. Ph.D. Dissertation Committee

*Note: At the time of printing of the BMMB Graduate Guide, the Penn State Graduate Council was revising the description and roles of the Dissertation Committee. Therefore, this description may change.*

From Penn State's Graduate Council: "Research is a complex enterprise, requiring both individual creative initiative and broad consultation with other research experts. Likewise, the education of a Ph.D. candidate – training in the broad methods of research generally, the specific methods appropriate to their discipline, and the values that define the research community - requires the active participation of a broad team of expert advisers at every step of the student's program. **Each Ph.D. student has a Dissertation Committee, whose purpose is to provide the attention, guidance, and mentoring necessary for the candidate to successfully earn their degree.**"

Student research and further coursework beyond the specific degree requirements are individually planned by the student and their dissertation advisor with consultation from the student's Ph.D. dissertation committee. The dissertation committee is established according to the rules of the Graduate School, and this must be done by the end of February of the year in which candidacy is approved to complete the Ph.D. candidacy process.

The committee consists of five active members of the graduate faculty, which includes at least two BMMB graduate faculty members in addition to the dissertation advisor. The dissertation advisor must be a member of the doctoral committee. The dissertation advisor usually serves as chair, but this is not required.

At least one member of the doctoral committee must represent a field outside the candidate's major field of study (BMMB) to provide a broader range of disciplinary perspectives and expertise. This committee member is referred to as the "Outside Field Member." An example would be a faculty member who is a member of MCIBS.

Additionally, to avoid potential conflicts of interest, the primary appointment of at least one member of the doctoral committee must be in an administrative unit that is outside the unit of the dissertation advisor's primary appointment (i.e. the advisor's administrative home; in the case of tenure-line faculty, this is the individual's tenure home). This committee member is referred to as the "Outside Unit Member." Note: The same individual may serve as both the Outside Field Member and the Outside Unit Member.

A person who is not a member of the Graduate Faculty (and may not be affiliated with Penn State), but who is otherwise qualified and has particular expertise in the student's research area, may be added as a "Special Member" upon recommendation by the Co-Directors of the Graduate Program and approval of the Graduate School Dean (via the office of Graduate Enrollment Services). A Special member is expected to participate fully in the functions of the doctoral committee. The Special Member cannot be designated as the Outside Field or Outside Unit Member.

This committee is an important resource for the student and should be utilized as an additional source of advice concerning academic matters and dissertation research. In addition, the Ph.D. dissertation committee administers both the Comprehensive and Final Oral Examination.

#### **Ph.D. Dissertation Committee Summary (5 total Graduate Faculty)**

Dissertation Adviser as Chair (BMMB Faculty Member)

Two additional BMMB Faculty Members

Outside Unit Member (Tenure home outside the tenure home of the adviser)

Outside Field Member (Faculty must be in a different graduate program than the student)

## **XII. Comprehensive Examination**

The purpose of the comprehensive examination is to determine whether the student has transitioned from a novice to an advanced Ph.D. student. The examination is designed to assess the student's broad conceptual knowledge of their discipline, the deeper knowledge of their field, critical thinking skills, experimental and computational skills, communication skills as well as their vision and motivation to complete the Ph.D. program.

To be eligible to take the Ph.D. comprehensive examination, students must have passed the qualifying examination and all of the required coursework for the degree must be successfully completed. Successfully completed means "C" or better in all lecture and seminar courses with an average of 3.0 or better for all non-research, non-teaching 400- or higher-level courses. The dissertation committee at the time of the comprehensive exam should evaluate the student's performance in coursework.

All students are required to demonstrate high-level competency in the use of the English language (reading, writing and speaking) and must meet the English competency requirement of the Graduate School prior to taking the comprehensive examination. The procedures for assessing English competency are described in a separate policy statement.

The oral comprehensive examination must be taken before the end of the spring semester that follows passing the qualifying examination. The qualifying examination is typically completed in the spring semester of the student's second year; therefore most students will complete the comprehensive exam by the end of the spring semester of their third year.

The oral comprehensive examination is given by the student's dissertation committee. As part of this examination, the student must write a research proposal in their area of research. The research proposal will serve as a focus for the examination, but the examination is **comprehensive** in nature and may deal with a wide variety of topics relevant to the student's chosen academic discipline(s).

The written proposal is limited to ten double-spaced pages, including text, figures and tables. References are not included in the page limit. The proposal must be presented to the dissertation committee members at least one week prior to the examination. The proposal must contain:

1. Title of proposed research project
2. Introduction including a survey of the current literature relevant to the problem
3. Specific objectives of the research

4. Research plan including experimental methods and procedures as well as possible outcomes and their interpretation(s); preliminary data may be included, if available, but it is not required
5. Potential importance of the project

The dissertation committee members will vote pass-fail at the end of the examination by secret ballot.

### **XIII. Annual Committee Meetings**

All BMMB students are required to hold an annual committee meeting. The committee meeting should be documented using the Graduate Student Activity Report (GSAR). The student is responsible for completing the "Student Summary" prior to the meeting. Following the meeting, the committee members and adviser should add their comments to the GSAR. Below are additional considerations for BMMB:

1. The comprehensive exam will serve as the annual committee meeting for third-year students continuing for the Ph.D. A committee meeting during the third year for terminal M.S. students is also required.
2. From the comprehensive exam onward, a committee meeting will need to take place on an annual basis for all Ph.D. and M.S. students. In practical terms, this means that it must occur during the academic year following the previous committee meeting. The committee meeting is based on the Eberly College of Science online Graduate Student Activity Report ([https://apps.science.psu.edu/grad\\_activity/](https://apps.science.psu.edu/grad_activity/)) prepared by the student and submitted to the committee members at least one week prior to the scheduled meeting. Within one week following the meeting, all committee members should enter their comments on the online GSAR. The adviser should complete their evaluation and submit the GSAR within two weeks following the committee meeting. This allows the student to view the committee and advisers comments.
3. For terminal M.S. students, a formal committee meeting is to take place each year. These meetings will be the basis for the Eberly College of Science online Graduate Student Activity Report ([https://apps.science.psu.edu/grad\\_activity/](https://apps.science.psu.edu/grad_activity/)) and will follow the same procedure as described above.
4. While it is recognized that the M.S. or Ph.D. committee is the ultimate authority as concerns a student's academic progress and eligibility to graduate, the GSAR is to be reviewed by the Associate Department Head for Graduate Education who may elect to become involved if it appears that serious problems exist.

### **XIV. Student Research Seminars and BMB Departmental Seminars**

In addition to coursework and research, students are strongly encouraged to attend BMB departmental seminars (Mondays at 4 pm in 108 Wartik Laboratory). Other departments in the Eberly College of Science and the Huck Institutes of the Life Sciences also sponsor seminars, which may be relevant to a student's area of interest. (<http://science.psu.edu/science-seminars> and <https://www.huck.psu.edu/content/events/upcoming>)

During the third and fourth years, students are required to present their own research seminar to the department. The Director of Graduate Affairs will be responsible for scheduling the sessions for the research seminar program. Students will be expected to present a seminar of approximately 45 minutes followed by questions and discussion. The seminar should include background, rationale, relevance, and data. In addition, the student may present future research plans as the final segment of the presentation. The dissertation advisor will introduce and mediate questions following the seminar. These two presentations will be done in addition to the dissertation seminar.

All graduate students, post-docs, and faculty are strongly encouraged to regularly attend student seminars. **However, attendance at all student research seminars is mandatory for all third and fourth year students.** Sessions that a student must miss for a legitimate reason (i.e. out of town for a scientific meeting) should be cleared with the Director of Graduate Affairs in advance. Presenters are encouraged to invite their dissertation committee to their research seminar.

## **XV. Dissertation, First Author Manuscript and Final Oral Exam**

The culminating experience for a BMMB Ph.D. student is the preparation of a formal Ph.D. dissertation, first author manuscript, public dissertation seminar, and final oral examination. The Graduate School has specific deadlines and formatting guidelines that must be followed both for the written dissertation and completing graduation requirements.

BMMB students must prepare and electronically submit a formal Ph.D. dissertation that meets the format, style and semester deadline requirements of the Graduate School. A polished, draft dissertation must be turned in to the dissertation committee, at least two weeks prior to the oral examination to allow the committee time to review the dissertation. If a committee member finds that there are serious problems with the content or format of the dissertation, they should notify the adviser immediately (at least a week before the oral examination) and the Graduate School recommends postponing the oral examination until the dissertation is in acceptable draft form.

BMMB students are required to demonstrate the ability to collect, organize and present the results of their research in writing in a professional manner. This is accomplished by preparing a manuscript based on the Ph.D. dissertation research. The manuscript must be primarily written by the student, approved by the dissertation adviser, and submitted for publication in a refereed journal before the committee can approve the dissertation.

Prior to the final oral examination, the student must give a public Ph.D. dissertation seminar to the department. This seminar may be given at any time within a two-week period prior to the scheduled examination, but may also be done as an integral part of the actual final oral examination if the seminar and the examination can be so coordinated. The final oral examination is only presented to the student's dissertation committee.

Following the oral examination, the student must electronically submit a final dissertation to the Graduate School with all revisions as suggested by the committee at the time of the oral exam. The student is also responsible for downloading and collecting signatures from the adviser and committee members for the "Doctoral Signatory Page". Please see the Graduate School website for details on dissertation formatting, forms, and deadlines.

## **XVI. Master of Science (M.S.) Overview and Procedures**

Students must meet the Master of Science (M.S.) degree requirements specified by the Graduate School in the Graduate Bulletin. The required coursework for an M.S. student is 30 credits of coursework at the 400 level of higher. This includes 18 credits at the 500 or 600 level (BMMB 602 and BMMB 590 do not count towards this requirement), 6 credits must be from BMMB 600, and 12 credits must be non-research credits (400, 500, or 800 level). The cumulative GPA must be at least 3.0. In addition, all M.S. students are required to take the qualifying examination during their second year. A research thesis must be submitted and defended before a committee of the faculty that will consist of at least three BMMB Graduate Program faculty members.

In general, an M.S. program is expected to take about two years beyond a bachelor's degree. The Graduate School has an eight year time limit on master's degrees, with the clock beginning on admission to the degree program.

## **XVII. BMMB Mentoring Guidelines**

Effective advising, open communication, and ethical professional conduct are essential for a high quality graduate education and research environment. Effective research advising must be based on a commitment to provide every student access to supportive guidance on a range of professional, ethical and collegial issues. A productive research mentorship requires that students are treated respectfully and fairly, and that the research advisor serves as a role model—upholding the highest ethical and professional standards. These guidelines embody many of the best practices used by the majority of our faculty here and elsewhere. They are intended to provide a heightened awareness of the need to consciously establish an effective and productive advisor-student relationship that starts with trust, courtesy, two-way communications, and shared expectations.

**BMMB Faculty Research Advisors should:**

- promote an environment that is intellectually stimulating, and free of harassment;
- be supportive, equitable, accessible, encouraging, and respectful;
- recognize and respect the cultural backgrounds of students;
- be sensitive to the power imbalance in the student–advisor relationship;
- avoid assigning duties or activities that are outside students’ academic/professional responsibilities;
- respect students’ needs to allocate their time among competing demands, while maintaining timely progress towards their degree;
- advise graduate students on the selection of appropriate course work, an appropriate thesis topic, and assist them in selecting a thesis committee;
- set clear expectations and goals for students regarding their academic performance and research progress;
- discuss policies and expectations for work hours, vacation time, and health contingencies;
- meet regularly (e.g. multiple times a semester) with students to provide feedback on research activities and progress;
- provide students with training and oversight in all relevant aspects of research, including the design of research projects, the development of necessary skills, and the use of rigorous research techniques;
- avoid pressuring students to interpret their results to unfairly support particular hypotheses;
- devise effective ways of providing students with guidance and supervision during prolonged absences;
- provide and discuss clear criteria for authorship at the beginning of all collaborative projects, and discuss how these contributions and author order may change over the duration of a project;
- encourage participation in professional meetings and try to secure funding for such activities;
- provide career advice, offer help with interview and application preparation, and write letters of recommendation in a timely manner;
- ensure students receive training in the skills needed for a successful career in their discipline, including oral and written communication and grant preparation as appropriate;
- acknowledge that some students will pursue careers outside of academia and/or outside their research discipline, and assist them in achieving their chosen career goals;
- schedule meetings to discuss topics other than research, such as professional development, career objectives and opportunities, climate, laboratory personnel relations, etc;
- be a role model by acting in an ethical, professional, and courteous manner toward other students, staff, and faculty;
- establish a culture of ethical scientific behavior in the lab, including but not limited to ethical behavior in experimental design, animal and human subjects concerns, and presentation/publication of data;
- strive to maintain continuous funding to support graduate students during their studies.

**BMMB students should:**

- recognize that they bear the primary responsibility for the successful completion of their degree;
- exercise the highest ethical standards in all aspects of their research (including but not limited to collection, storage, analysis, and communication of research data);
- complete all tasks assigned by the department, including teaching, grading, and other assistantship responsibilities;
- know the policies governing graduate studies in the department and the graduate school, and take responsibility for meeting departmental and graduate school deadlines;
- be proactive about communicating with their advisor and thesis committee, understanding that communication is a two-way endeavor;
- be considerate of other time constraints imposed on faculty and staff, including competing demands;
- take an active role in identifying and pursuing professional development opportunities, and clearly communicate with their advisor(s) regarding their career preferences;
- be proactive about improving their research skills, including written and oral presentation skills;
- inform faculty advisors of potential and/or existing conflicts and work toward their resolution;
- seek mentoring and support resources beyond their faculty advisor(s), including other faculty members, peers, and organizations;

- obtain outside help from ombudsmen, director of graduate studies, or other faculty if conflicts arise with their advisor;
- be aware that if they feel compelled to change advisors or research direction, they have options and should consult with their advisor, other mentors, or department officers;
- always act in an ethical, professional, and courteous manner toward other students, staff, and faculty;
- seek out and strive to attain competitive recognition of their scientific achievements, e.g. via external fellowships and publication of their studies.

**BMMB will:**

- provide students with up-to-date information that includes policies, practices, degree requirements, and resources;
- assist students with selection of their advisor as needed, and provide students with contacts and resources for potential conflict resolution (e.g. ombudsperson, director of graduate studies, department head);
- provide pedagogical training and regular assessment of their teaching and other assistantship activities;
- monitor graduate student progress towards their degrees and professional development, including mentoring meetings, committee meetings, exam completions and other benchmarks appropriate to their discipline;
- provide and monitor training in the ethical conduct of research;
- provide appropriate infrastructure to allow students to complete their education and research in a timely and productive manner;
- provide opportunities for professional development that will be relevant to students seeking careers outside academia and/or their research discipline;
- establish and communicate policies for emergencies and unplanned situations that may disrupt the work of students and/or faculty;
- incorporate these guidelines and recommendations in their departmental policies or handbooks and actively promote their observance;
- work with faculty, students, and departments to maintain continuous financial support for students during their graduate studies, whether through assistantships, scholarships, grant funds, or other mechanisms.

**XVIII. Advising Resources and Conflict Resolution**

During a student's tenure, the need may arise to seek advisement or assistance. The following is a brief list of resources available to students and faculty. The Graduate School and Penn State provide additional resources.

The Dissertation Advisor: The student should consult with their dissertation advisor regularly during their time as a graduate student. The advisor should be the first point of contact for advising and addressing concerns.

The Dissertation Committee: The student should meet with members of their dissertation committee both during regular committee meetings, as well as one-on-one meetings, if needed. The dissertation committee is an additional source of advice concerning academic, dissertation research, and career planning.

The Graduate Program Administration is available for a variety of needs, including:

- The Graduate Program Liaison Officer is available to confidentially discuss problems, assist in mediation, academic and career advising, and general student concerns.
- The Director of Graduate Affairs is available for general advising, especially prior to the selection of a dissertation advisor, and is a source of information regarding policies within the BMMB graduate program.
- The Associate Department Head for Graduate Education can provide an alternate resource for the student if questions remain after talking with the Liaison Officer or Director of Graduate Affairs, or if the student feels more comfortable with the Associate Department Head for Graduate Education .

Ombudsmen: Additionally, BMB maintains two ombudsmen to assist all department members. The function of the ombudsmen is to provide a safe and informal environment for individuals to discuss problems and issues outside of formal channels. Any issue may be brought to the attention of the ombudsmen. The ombudsman can help develop strategies, clarify interests and goals, and identify other resources at the university that may be available to assist in certain situations. It is also important to note that speaking to the ombudsman does not constitute notice to the university. The ombudsmen do not have the power to change rules or policies and will not disclose any information provided in confidence (the only exception to this rule being a potential risk to safety or if a crime was committed). The BMB Ombuds representatives are Dr. Maria Krasilnikova ([muk19@psu.edu](mailto:muk19@psu.edu)) and Dr. Ola Sodeinde ([oas1@psu.edu](mailto:oas1@psu.edu)).

The BMB Department Head is available as an alternate resource for any student with concerns about their graduate education program.

Eberly College of Science, Associate Dean for Graduate Education is an additional resource for students and will try to assist with whatever situation arises. The Associate Dean is a voice for all graduate students within the college and is passionate about creating a positive climate for all members of the college.

Penn State Associate Dean for Graduate Student Affairs is a resource for students outside of their program, department, and college.

Counseling and Psychological Services (CAPS) can help students resolve personal concerns that may interfere with their academic progress, social development, and satisfaction at Penn State. Some of the more common concerns include difficulty with friends, roommates, or family members; depression and anxiety; sexual identity; lack of motivation or difficulty relaxing, concentrating, or studying; eating disorders; sexual assault and sexual abuse recovery; and uncertainties about personal values and beliefs. <http://studentaffairs.psu.edu/counseling/>

## **XIX. Career and Professional Development**

BMMB strives to provide our graduate students with the resources necessary to be successful in obtaining and securing a satisfying and rewarding career. Throughout the year, students have opportunities to hear and meet speakers who have used their scientific backgrounds in different ways. Taking advantage of these events is a great way to explore career options. Events are emailed weekly and a current list of events and resources related to career and professional development is maintained here: [https://www.huck.psu.edu/content/graduate-programs/career\\_professional\\_development](https://www.huck.psu.edu/content/graduate-programs/career_professional_development)

BMMB students are highly encouraged to use an individual development plan (IDP) to help identify career development goals. Science has put together an online IDP tool call myIDP (<http://myidp.sciencecareers.org/>). In addition to assisting you with your career goals, many funding agencies require the submission of an IDP with fellowship applications.

## **XX. BMMB Travel Awards**

BMMB graduate students are eligible for two travel awards to defray the expense of attending a scientific meeting. “BMMB Travel Award 1” is being provided to first and second year BMMB graduate students to defray the expense of attending a meeting by the end of the second year of graduate training. The purpose of this award is to provide students early in their graduate training an opportunity to learn about the most recent advances in their respective fields of study, and to establish contacts with other researchers in the field. To be eligible for this award, a student must be accompanied at the meeting by a senior researcher, preferably the student’s advisor. Alternatively, one BMMB faculty member can escort at least four first and second year BMMB graduate students to a meeting, and both the faculty and each student will be eligible for travel awards. The faculty escort is charged with ensuring that the students engage themselves in the meeting. “BMMB Travel Award 2” is reserved for students presenting a talk or a first author poster at a scientific meeting. This award is intended to be used following the comprehensive exam and before graduation.

### **XXI. Obtaining Signatures on Paperwork**

During your tenure at Penn State, there will be several official documents that will require signatures from various faculty members in the BMMB graduate program, as well as the Director of Graduate Studies and/or the BMB Department Head. It is very important to plan ahead when you need a signature as faculty are not always available for last minute signatures.

To obtain a signature from the Associate Department Head for Graduate Education (Ken Keiler), you may contact him by email to set up an appointment or leave your paperwork with Linda Kunes in 107 Althouse.

To obtain a signature from the BMB Department Head (Dr. Wendy Hanna-Rose), all paperwork should be submitted to their administrative assistant, Ms. Traci Shimmel (tks1@psu.edu), in 105 Huck Life Sciences Building.

### **XXII. Academic Integrity**

Maintenance of academic integrity at all times is an essential part of graduate work and the pursuit of science as a career. Cheating on examinations, falsifying (altering) or fabricating (making up) research data, or plagiarizing someone else's work (passing off someone else's ideas as one's own) in any setting may serve as grounds for dismissal from the graduate program. Infractions will be dealt with according to University Policy (<http://senate.psu.edu/policies-and-rules-for-undergraduate-students/47-00-48-00-and-49-00-grades/#49-20>).

### **XXIII. Exceptions to BMMB Policy**

Under extenuating circumstances, the BMMB Steering Committee will review requests made jointly by both student and advisor, and make a recommendation to the Department Head concerning possible deviations from the stated BMMB policies.

## Sample Class Schedule for a BMMB Student

Note: Use BMMB 600 to bring total credits to 12. Must have 6 elective credits at the 500 or 800 level.

### Fall 2018 (Year 1)

Course Number	Course Name	Credits	Notes
BMMB 501	Core Concepts in Biomolecular Science	5	Required Course
BMMB 507	Seminar in BMMB	2	Required Course
BMMB 509	Ethics in Biomedical Science	1	Required Course
BMMB 602	Supervised Experience in College Teaching	1	Does not count towards course credits.
BMMB 600	Thesis Research	3	Does not count towards course credits.

### Spring 2019 (Year 1)

Course Number	Course Name	Credits	Notes
BMMB 502	Critical Analysis	1	Required Course
BMMB 543	Current Topics in Gene Regulation	3	Elective Course
BMMB 602	Supervised Experience in College Teaching	1	Does not count towards course credits.
BMMB 600	Research	7	Does not count towards course credits.

### Fall 2019 (Year 2): Take Qualifying Examination

Course Number	Course Name	Credits	Notes
BMMB 551	Genomics	3	Elective Course
BMMB 511	Molecular Immunology	2	Elective Course
BMMB 602	Supervised Experience in College Teaching	1	Does not count towards course credits.
BMMB 600	Research	6	Does not count towards course credits.

### Spring 2020 (Year 2)

Course Number	Course Name	Credits	Notes
STAT 500	Applied Statistics	3	Elective Course
BMMB 590	Colloquium	1	Does not count towards course credits.
BMMB 600	Research	8	Does not count towards course credits.

### Fall 2020 (Year 3): Take Comprehensive Exam

Course Number	Course Name	Credits	Notes
BMMB 852	Applied Bioinformatics	2	Adviser recommended course. Student completed course requirements Spring 2020.
BMMB 590	Colloquium	1	Does not count towards course credits.
BMMB 600	Research	9	Does not count towards course credits.

### Spring 2021 (Year 3) – Graduation (Year 5-6)

Course Number	Course Name	Credits	Notes
BMMB 601	Ph.D. Dissertation Full-Time	0	

## Blank Class Planner for a BMMB Student

Note: Use BMMB 600 to bring total credits to 12. Must have 6 elective credits at the 500 or 800 level.

### **Fall 2018 (Year 1)**

Course Number	Course Name	Credits	Notes
BMMB 501	Core Concepts in Biomolecular Science	5	Required Course
BMMB 507	Seminar in BMMB	2	Required Course
BMMB 509	Ethics in Biomedical Science	1	Required Course
BMMB 602	Supervised Experience in College Teaching	1	Does not count towards course credits.
BMMB 600	Thesis Research	3	Does not count towards course credits.

### **Spring 2019 (Year 1)**

Course Number	Course Name	Credits	Notes
BMMB 502	Critical Analysis	1	Required Course
BMMB 602	Supervised Experience in College Teaching	1	Does not count towards course credits.
BMMB 600	Research		Does not count towards course credits.
			Elective Course 1
			Elective Course 2

### **Fall 2019 (Year 2): Take Qualifying Examination**

Course Number	Course Name	Credits	Notes
BMMB 602	Supervised Experience in College Teaching	1	Does not count towards course credits.
BMMB 600	Research		Does not count towards course credits.
			Elective Course 1
			Elective Course 2

### **Spring 2020 (Year 2): 19 credits of coursework must be completed by end of semester.**

Course Number	Course Name	Credits	Notes
BMMB 590	Colloquium	1	Does not count towards course credits.
BMMB 600	Research		Does not count towards course credits.
			Elective Course 1
			Elective Course 2

### **Fall 2020 (Year 3)**

Course Number	Course Name	Credits	Notes
BMMB 590	Colloquium	1	Does not count towards course credits.
BMMB 600	Research		Does not count towards course credits.
			Elective Course 1
			Elective Course 2

### **Spring 2021 (Year 3): Last Semester to Take Comprehensive Exam and Last semester to take additional electives without tuition charge.**

Course Number	Course Name	Credits	Notes
BMMB 590	Colloquium	1	Does not count towards course credits.
BMMB 600	Research		Does not count towards course credits.
			Elective Course 1
			Elective Course 2

### **Fall 2021 (Year 4) – Graduation (Year 5-6)**

Course Number	Course Name	Credits	Notes
BMMB 601	Ph.D. Dissertation Full-Time	0	

## **BMMB Qualifying Examination Policy (revised August 2018)**

### **Timing of the qualifying examination:**

All Ph.D. students are required to take the qualifying examination prior to November 15 of their second year. Ph.D. students must pass the qualifying examination to continue pursuing a Ph.D. degree.

### **Course requirements prior to the qualifying examination:**

Students are not required to have all of their coursework completed at the time of the qualifying examination. Coursework will be monitored by the Director of Graduate Affairs (Heather Giebink), and completed coursework will be discussed at the Qualifying Evaluation Meeting in January/February.

*Note: All required coursework must be successfully completed by the end of spring semester of the second year, and before a student can take the comprehensive examination. Successfully completed means "C" or better in all lecture and seminar courses with an average of 3.0 or better for all approved 400-, 500-, or 800-level courses.*

### **THE QUALIFYING EXAMINATION:**

**Purpose:** The purpose of the qualifying examination is to assess whether the student is capable of conducting graduate research based on evidence of critical thinking skills, understanding of the scientific method, and knowledge of relevant subject matter.

### **Administration (Listed in chronological order):**

1. Each year, the BMB Department Head will appoint the BMMB Steering Committee, which will be responsible for:
  - a. Overseeing the administration of qualifying examinations to all BMMB graduate students during the fall semester of their second year as described below. The committee will report a PASS or FAIL grade for each of the oral qualifying examinations to the BMMB Graduate Faculty at the annual meeting in which qualifying decisions are made (see below).
  - b. Evaluating the qualifying examination written documents for attainment of English writing proficiency as specified by the BMMB program policy on English proficiency for doctoral students. The results of the English writing proficiency evaluation will be reported to the Director of Graduate Affairs as PASS or FAIL for each student taking the examination. Although a student may still pass the qualifying examination if they fail this written English proficiency assessment, remedial activities and re-assessment will be required prior to the scheduling of the comprehensive examination. This re-assessment will entail a supervised essay administered by the BMMB Steering Committee.
  - c. Evaluating the oral qualifying presentation for competency of spoken English for any students who received a "FAIL" in BMMB 507 the previous fall semester. The Director of Graduate Affairs will provide the BMMB Steering Committee with a list of students who will need their spoken English evaluated during their qualifying exams by the faculty panel.
2. During the summer following their first year, all BMMB students will prepare a two-page written summary with a maximum of one additional page of optional figures of their research. Literature citations can be placed on additional pages as necessary. A hard copy and an electronic copy of the summary must be submitted to the Graduate Program Coordinator (Linda Kunes) no later than the first day of August that falls on a weekday.
  - a. Criteria for the written research summary
    1. **Specific Research Problem:** The summary should include a clear, concise and original description of the hypothesis (es) and questions to be addressed for the dissertation research.
    2. **Rationale and Significance:** The summary should present a rationale for the hypothesis and set the work in the context of the field to demonstrate its significance.

3. Experimental Design: The summary should include a succinct description of the experimental approaches that the student plans to use for investigating the hypothesis. Appropriate backup strategies should also be described.
  4. Expected Outcomes: The summary should include the expected outcomes of the proposed study, and how these results would drive the field forward.
- b. Additional guidelines for the written research summary
1. Formatting Requirements: The summary will contain a descriptive title. The document must be single-spaced, using 11 point Arial font and one inch margins. The use of complete sentences and well-structured paragraphs is essential.
  2. Reference Guidelines: Students will use complete reference citations (all authors, year of publication, complete article title, journal name, volume, and both beginning and ending page numbers). Citing Wikipedia or other on-line URLs is not allowed. All referenced papers need to have names or numbers at appropriate locations in the text to show what the references are being cited for, and there should not be any references in the list that are not cited at least once in the text portion of the research summary.
  3. Figure Guidelines: Students can include one page of figures, however all figure legends must be included in the two pages of text, and not on the separate page with the figures. There are no limits to the number of figures on the page, but images and text must be legible. Student-created summary or overview figures that enhance communication of the proposed research to the faculty panel during the oral exam may be preferable to using numerous figures from references. Each figure from a published paper must be accompanied by an appropriate citation.

Formatting Summary

Descriptive title

Text (2 page limit)

Figures (1 page limit)

References (no page limit)

- c. Drafts and Feedback: Students may request that their faculty research advisor, or other member of the lab group, read up to two drafts to provide general comments and advice. However, the research summary should be the student's own work, and should not involve any detailed editorial assistance from anyone else.
3. At the beginning of the fall semester, the BMMB Steering Committee will meet to assign a qualifying examination panel for each of the second-year students.
  4. Upon reviewing the research summary for each assigned student, the qualifying committee chairperson will assign additional members of the BMMB Graduate Faculty to serve on each panel. Advisors and co-advisors are excluded from serving on panels for their own students. The assignments should be done so as to spread the workload evenly among the graduate faculty while ensuring that each panel has both depth and breadth representatives. Once the assignments are made, each panel member will receive a copy of the student's research summary, and a copy will be placed in the student's folder.
  5. The qualifying examination panel chairperson will consult with the advisor(s) of each assigned student to select a paper from the recent research literature that will be used as a vehicle for the initial part of the student's oral qualifying examination. That paper should be in an area related to the student's research, but it should not be on a topic directly involved with that research. The advisor is not to reveal which papers have been discussed to the student.

6. The student is responsible for contacting each member of the assigned qualifying examination panel to schedule a date, time and location for a two-hour oral examination. The examination must be completed before November 15. The student will be provided with a copy of the selected research paper three weeks before the scheduled date of the examination, and the student will provide all members of the panel with a referenced one-page critical analysis of the paper no later than one week before the scheduled date of the oral examination.
  - a. Criteria for the written critical analysis of the paper
    1. Summarize the purpose of the study.
    2. Identify the hypothesis(es) being tested.
    3. Discuss how the methods test the hypothesis.
    4. Evaluate the appropriateness of the authors' conclusions.
  - b. Additional guidelines for the written research summary
    1. Formatting Requirements: The summary should contain a descriptive title, be single-spaced, and should use 11 point Arial font and one inch margins. The use of complete sentences and well-structured paragraphs is essential.
    2. Reference Guidelines: Students should use complete reference citations (all authors, year of publication, complete article title, journal name, volume, and both beginning and ending page numbers). References can be included on a separate page. Citing Wikipedia or other on-line URLs is not allowed.
  - c. Drafts and Feedback: The student may seek assistance in identifying appropriate background materials and/or assistance with techniques and methods, but the student may not obtain any assistance in evaluating the paper to be used during the examination, nor may the student present the paper in a journal club, lab meeting, or any other setting before the oral examination.
  - d. Note: A critical analysis should not be confused with criticism of the paper. Rather, the student should evaluate the merits of the work, and decide whether the author's conclusions are justified.
7. The student should prepare a twenty-minute presentation of the assigned research paper for the oral examination. This presentation should provide a critical analysis of the paper involving the hypothesis(es), an experimental overview, an analysis of data and its interpretation, and a discussion of possible follow-up studies. After assessing the student for a critical understanding of the science in the paper, the panel will question the student on the student's research. No prepared audio-visual materials may be used for the research component, but the student may be asked to write on the blackboard or whiteboard by the examination panel.
8. The student's performance will be evaluated using the following criteria:
  - a. Written and Oral Evaluation of the Critical Analysis of Research Paper
    1. Has the student clearly described the hypothesis(es) from the paper?
    2. Has the student demonstrated a reasonable understanding of the experimental approach utilized in the paper?
    3. Has the student demonstrated a reasonable critical understanding of how the experimental data in the paper has been interpreted, and how it might be extended in follow-up studies?
    4. Does the student's one-page critical summary of the assigned paper indicate an ability to provide a reasonable evaluation of a research article?
  - b. Written and Oral Evaluation of the Summary of Student's Proposed Research

1. Does the discussion of the student's own research indicate that the student has a good understanding of the scientific significance of their project, a clear idea of where that research might be leading them, and how their results would drive the field forward?
  2. Has the student demonstrated a reasonable starting-level knowledge of important concepts and techniques as they might apply to their own area of research?
- c. Overall Performance
1. Has the student demonstrated an ability to answer questions regarding alternative approaches, interpretations, and rationales?
  2. Does the student's oral performance indicate a reasonable understanding of the relevant scientific literature?
  3. Were the written components of the exam well organized? Were appropriate grammatical conventions used and formatting guidelines followed?
9. Since students will have just started their doctoral research and will be in the early stages of developing their projects, panel members should not expect students to be able to display the same level of mastery that would be expected at a comprehensive exam. In judging the student's overall performance on the qualifying examination, more weight should be placed on their critical analysis of the article than on the research summary.
  10. At the end of the examination, the panel members may discuss the student's performance, but they should not discuss their intentions with regard to voting. The panel members will then individually grade the performance by secret written ballot, indicating Good, Fair or Poor. An average of Fair will constitute a passing performance, with the understanding that a Good and a Poor vote is equivalent to two Fair votes. Two Fair and a Poor vote will be considered a failing performance. The vote will be reported to the chair of the BMMB Steering Committee. The qualifying panel chairperson will also provide the student, the research advisor, and the other panel members with a written synopsis of the student's performance on the exam regardless of outcome. A copy of the synopsis will also be placed in the student's folder.
  11. Students who fail their examination the first time must re-take and pass the examination by January 15 of their second year to continue in the Ph.D. program. Students who have not passed the qualifying examination on their first or second attempt by January 15 of their second year will be designated as terminal M.S. students. Students failing their first examination may elect to have the second examination administered by the same faculty panel, or they may choose to have an entirely new panel appointed by the BMMB Steering Committee.
  12. English writing proficiency will be evaluated prior to the oral qualifying examination by the BMMB Steering Committee. In the case of a student who received a "FAIL" in BMMB 507 the previous fall semester, the qualifying examination panel will also judge at the end of the examination whether the student has acquired competency of spoken English. This vote is independent of the results of the qualifying examination.

**Assessment and Outcomes of the Qualifying Decision:**

1. The BMMB Steering Committee will meet in late January to make a final qualifying decision for those students who have passed their oral examination. Prior to the meeting, input will be solicited from all faculty who wish to comment on a student taking the qualifying examination. This input should be provided in writing to the Graduate Program Coordinator. The decision to pass will be based on completed coursework, teaching, research, and passing the oral qualifying examination. Research mentors will be required to submit a written evaluation of the student's research to the Graduate Program Coordinator at least one week prior to the

meeting. It is the prerogative of the committee to deny qualifying to students who have passed the oral examination if they feel that other considerations warrant that denial.

*NOTE: The meeting will be announced to the BMMB faculty and all BMMB faculty members are welcome to attend this meeting. Advisors may inform their own advisees whether they have passed or failed after this meeting, but should not discuss the fate or relative standing of other students who were under consideration.*

2. The BMMB Steering Committee will notify the students of the outcome of the qualifying decision by letter within seven days of the qualifying decision meeting. The possible outcomes are listed below.

Group 1 - possibilities for students who passed the oral qualifying examination:

- a. Qualifying effective immediately. (GPA must be 3.0 or higher and have successfully completed teaching requirements.)
- b. Qualifying to be awarded upon successful completion of teaching requirements (GPA must be 3.0 or higher).
- c. Qualifying to be awarded if so recommended by the thesis committee upon successful completion of an M.S. degree.
- d. Qualifying decision deferred if GPA is less than 3.0 and coursework is not complete at the time of the qualifying decision meeting.
- e. Qualifying not awarded if the required 19 credits of coursework are complete and GPA is less than 3.0.
- f. Qualifying not awarded because of poor performance in research and/or teaching.

Group 2 - outcome for students who failed the oral qualifying examination:

- g. Qualifying not awarded on the basis of having failed the oral qualifying examination twice.

3. The Director of Graduate Studies will notify the Graduate School if students are qualified to take the comprehensive exam.

**Additional matters:**

1. Voting - a simple majority vote of the BMMB Steering Committee is required for all decisions.

# **BMMB English Competency Assessment**

## **I. Expectations Regarding English Competency**

### **A. Speaking Competency Expectations**

Students in BMMB will be expected to demonstrate proficiency in communicating scientific information in a formal professional setting. To achieve this objective, they must first be capable of effective communication during normal conversation and scientific discussion in an informal one-on-one setting. This assumes adequate vocabulary for normal conversation, and we will expect students to learn the required technical terminology as they progress in their graduate training. We do not necessarily expect our students to have perfect pronunciation and enunciation, but we expect their spoken English to be of sufficient quality so that their speech patterns are not overly distracting to a listener attempting to understand the content of a presentation. The key criterion is their ability to effectively communicate scientific information. They will also be expected to develop the necessary speaking skills that will allow them to organize a presentation or lecture that includes introductory remarks, results (with an integrated description of methodology), interpretation/discussion and conclusions.

### **B. Writing Competency Expectations**

Students in BMMB will be expected to demonstrate proficiency in communicating scientific ideas and information in writing. Correct grammar, spelling and punctuation are all necessary components of this requirement. The student will be expected to write documents that are clear, concise and logically organized. An additional area of emphasis will be the need to provide smooth transitions between sections or topics.

## **II. Procedures for Assessing Speaking Competency**

### **A. Assessment of English Speaking Competency**

A formal evaluation of each student's spoken English proficiency will be made on the basis of oral presentations that the student will make in our General Seminar course (BMMB 507) during their first fall semester. Students who receive a passing grade on their English speaking ability in BMMB 507 will have completed their spoken English proficiency requirement.

### **B. Improving English Competency of Students with Speaking Deficiencies**

Students whose spoken English ability is judged inadequate on the basis of that presentation will be required to formally enroll in ESL 114G and achieve a B- in the course. Students will be formally evaluated again at their oral candidacy exam.

### **C. Attainment of Spoken English Competency**

Students who did not receive a passing grade on their English speaking ability during BMMB 507 will be evaluated for the second time during their oral qualifying examination presentation in the fall semester of their second year. Students will be evaluated by the faculty examination panel. Students who receive a passing grade will have completed their spoken English proficiency requirement. Students who fail to receive a passing grade will be dropped from the graduate program.

## **III. Procedures for Assessing Writing Competency**

### **A. Assessment of English Writing Competency**

For the qualifying examination in the fall of the second year, all BMMB students prepare a two-page research summary of their proposed research project. The summary will be graded by the faculty examination panel, and the assessment will be based solely on the demonstration of proficiency of writing in English. Students who receive a passing grade will have completed their English writing requirement.

### **B. Improving English Competency of Students with Writing Deficiencies**

Students who do not receive a passing grade on their initial formal evaluation will be required to participate in remedial writing activities consisting of one or both of the following:

1. Domestic and International students will write two documents under the supervision of their research advisor during the spring and summer semesters of their first year. These may be topical mini-review papers or monthly/quarterly reports of the student's research. The student will be expected to make appropriate revisions after these papers have been graded for both scientific content and English acceptability by the research advisor.

2. International students only (domestic students may not take ESL courses) may enroll in ESL 116G in the spring or summer of their first year for additional remediation upon advisement of their dissertation advisor and/or the BMMB Steering Committee. A grade of a B- or higher should be achieved.

### **C. Attainment of Written English Competency**

Students who have not satisfied the requirement for English writing competency will write an extended essay on a science related ethics issue which must be completed by no later than the first day of August that falls on a weekday in the students second year. Students who receive a passing grade on this essay, which is evaluated by the BMMB Steering Committee, will have successfully completed their English writing requirement. Students who fail to receive a passing grade will be dropped from the graduate program.

## Graduate Student Resource Guide

This is a brief list. A complete list of resources can be found on our website:

<http://bmb.psu.edu/graduate/current-students/student-resources>

**The Affirmative Action Office** is committed to ensuring the University maintains an environment free of harassment and discrimination. <http://www.psu.edu/dept/aaoffice/>

**International Student Services** provides answers to questions and needs that are unique to international students. The office is located at 410 Boucke Building. <https://global.psu.edu/internationals-penn-state>

**The Office of the Vice Provost for Educational Equity** serves as a catalyst and advocate for Penn State's diversity and inclusion initiatives. <http://equity.psu.edu/>

**LGBTQA Student Resource Center** provides a comprehensive range of programming, education, information, and advocacy services. <https://studentaffairs.psu.edu/lgbtqa/>

**Graduate and Professional Student Association (GPSA)** is the representative body for all graduate students. The GPSA addresses issues of concern to graduate students and elects members to sit on shared-governance bodies of the University. The GPSA also organizes social events for graduate students.

<http://gpsa.psu.edu/>

**The Office for Disability Services** provides information and assistance to students with disabilities

<http://www.equity.psu.edu/ods/>

**The Writing Center** is sponsored by the Graduate School and provides assistance to graduate students who wish to enhance their writing skills. Graduate students are invited to schedule appointments for one-on-one discussions of their writing projects. <http://pwr.la.psu.edu/resources/graduate-writing-center/GWC>

**Off-Campus Housing** opportunities are listed in 213 HUB-Robeson Center, 865-2346.

<http://studentaffairs.psu.edu/offcampus/>

**Penn State Safe Walk Service** is operated under the auspices of Police Services and will provide an escort for students walking on campus after dark. The escort service may be reached at 5-WALK (865-9255).

<http://www.police.psu.edu/up-police/services/safe-walk-service.cfm>

**The Clery Act** lists crime statistics and information from the past three years that occurred: 1) on campus, 2) in certain off-campus buildings, owned, or controlled by Penn State, 3) on public property within, or immediately adjacent to and accessible from the campus. <http://www.police.psu.edu/clery/>

**Office of Student Conduct** is responsible for dealing with violations of the Code of Conduct including sexual assault, harassing, stalking, and physical assault. The phone number is 863-0342.

<http://studentaffairs.psu.edu/conduct/>

**HUB-Robeson Center** is the site for multiple student services including restaurants, a copy center, a bank (Penn State Federal Credit Union), STA Travel, a convenience store, the Penn State Bookstore, the Center for Arts and Crafts, Art Galleries, and the main information desk for the University.

<https://studentaffairs.psu.edu/hub>

### Academic Integrity

The University does not tolerate violations of academic integrity, which include but are not limited to: plagiarism, cheating, falsification of information, misrepresentation or deception. The Eberly College of Science policies and

the links for the University policies is available at: <http://science.psu.edu/current-students/Integrity/Policy.html>

**Counseling and Psychological Services (CAPS)** can help students resolve personal concerns that may interfere with their academic progress, social development, and satisfaction at Penn State. Some of the more common concerns include difficulty with friends, roommates, or family members; depression and anxiety; sexual identity; lack of motivation or difficulty relaxing, concentrating or studying; eating disorders; sexual assault and sexual abuse recovery; and uncertainties about personal values and beliefs.

<https://studentaffairs.psu.edu/counseling>

**Career Services**, located in the MBNA Career Services Building, is fully equipped to assist graduate students in the preparation of resumes and curriculum vitae and in developing effective interviewing skills. Career Services hosts a career fair that is open to graduate and undergraduate students. <http://studentaffairs.psu.edu/career/>

**Research Protections** is the office that oversees all research on human participants, animals, radioisotopes and biohazardous materials. You must have permission from this office prior to conducting research involving any of these subjects. Permission cannot be obtained after the work has begun. <http://www.research.psu.edu/orp/>

**Pasquerilla Spiritual Center** is home to more than fifty spiritual organizations. The center is non-denominational and provides students with opportunities to explore ethical and spiritual issues. <http://studentaffairs.psu.edu/spiritual/>

### **Problem resolution**

Graduate students occasionally have difficulties with their advisors, their programs or an academic matter associated with their programs. The first step in problem resolution is always to talk with your advisor and then with the Graduate Program Liaison Officer, Department Head, and Associate Dean of your college. If satisfactory resolution remains elusive, the Associate Dean of the Graduate School is available to provide guidance and maintain neutrality. Issues discussed during meetings with the Associate Dean will remain confidential if requested by the student. Appointments may be made by calling 865-2516.

### **Plagiarism**

Plagiarism is often a confusing concept. At Penn State, plagiarism means taking someone's words and presenting them as your own. Cutting and pasting from a web site is considered plagiarism. Copying verbatim from any source without using quotation marks and the full reference is plagiarism. Plagiarism is a serious violation of academic integrity regardless of whether it is a homework exercise, an exam, a thesis, or a manuscript for publication. <http://tlt.its.psu.edu/plagiarism/tutorial>

**University policies** may be viewed on line. Important policies include:

Sexual Harassment (AD41)

Professional Ethics (AD47)

Parking Rules (BS04)

Intellectual Property (RA11)

<http://guru.psu.edu/policies/>

**Graduate Student Policies** are available on line

These include:

Grade mediation (G-10)

Resolution of problems (Appendix II)

Termination of program (Appendix III)

Termination of assistantship (Appendix IV)

Residency requirements (Appendix V)

<http://www.gradschool.psu.edu/current-students/student/>