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Graduate Program in Integrative Biology and Physiology (IBP)
Introduction

Message from the IBP Director of Graduate Studies (DGS):

Welcome! Physiology may be defined as the application of mathematics, physics and chemistry to the study of structure and function in living systems. As such, physiology is a “hybrid” field in which expertise from many other disciplines is ordinarily required and combined.

The program emphasizes a quantitative approach to understanding the functions of cells, organs and systems in living animals. PhD students take a core concentration that provides a broad background in the physiology of membranes, cells, transport and organ systems. Individualized programs are structured to build on the student’s strengths and to fill in gaps that would otherwise be an impediment to specific problem solving.

Areas of specialization include a growing cardiovascular core and other areas as well. We are glad you are in the IBP Graduate Program and wish you success in your endeavors!

~ Jop van Berlo, Director of Graduate Studies

The IBP Graduate Program handbook provides information on requirements, policies and logistics in the IBP department, the University and the Graduate School. The information provided in this handbook should be used as a supplement to the University’s Graduate Student Handbook. IBP Graduate Students should become familiar with the following University guidelines and resources:

- [Graduate School (grad.umn.edu)](http://grad.umn.edu)
- [Office of Professional Development](http://professional.umn.edu)
- [Office of Biomedical Research, Education & Training](http://bmer.umn.edu)
- [Office for Equity and Diversity](http://equity.umn.edu)
- [University Catalogs - Graduate Education](http://grad.umn.edu/catalog)
- Prospective Students: [Graduate School Admissions](http://grad.umn.edu/admissions)
- Current Students: [Graduate Student Services and Progress (GSSP)](http://grad.umn.edu/student-services)
- [One Stop Student Services (onestop.umn.edu/academics)](http://onestop.umn.edu/academics)
- [Graduate Assistant Employment Services](http://gsas.umn.edu)
- [Counsel of Graduate Students](http://counsel.umn.edu)

For any questions that are not addressed in this handbook, students should contact
Human Resources information: Christopher Denu, 612-625-2876 or denux002@umn.edu
Academic Information: Jop van Berlo, jvanberl@umn.edu
Other questions: Jane Mayhew Barnard 612-624-8151 or mayhe001@umn.edu
Program Description
Graduate level course work in cell & molecular physiology and medical physiology provide a foundation for PhD Program students. Course credits are intended to provide doctoral students the necessary intellectual and professional foundation for their thesis projects, future career and professional activities.

In the first year of the PhD program, students are required to take courses in Cell and Medical Physiology, as well as three to four laboratory rotations and our seminar course. The coursework is tailored to the student’s interests with input from the director of graduate studies and the advisor. During the first year, students rotate through three laboratories, choose an advisor, and begin a research project.

A preliminary written exam (PWE) in physiology is taken after the first two semesters of classes and is based on the Cell Physiology, Medical Physiology & related seminar coursework. The preliminary oral exam (POE), at the end of the second year, is given to test the student’s ability to apply principles of both physiology and the minor or supporting program to a proposed research-based thesis. A doctoral student must write a thesis project proposal and must successfully defend it in the preliminary oral exam. This exam must be scheduled with The Graduate School and cannot be held until all work on the official course program has been completed and the written preliminary exam has been passed.

After the successful completion of the preliminary oral exam, the student is expected to do primarily thesis research. At the completion of the thesis research, the student must write their thesis and then orally defend it (thesis defense) in order to graduate. A student must also have at least one research paper submitted for publication.

a. Goals and Objectives of the PhD Program in IBP

Dedicated to an integrative systems biology approach to biomedical discovery.
We partner with colleagues across disciplines to investigate questions ranging from the gene/molecule to the whole animal, striving for excellence in research and dissemination of new knowledge with local, national, and global impact.

Committed to mentoring and training graduate students.
We empower students to develop a deep understanding of the complexity of physiological systems to enable them to pursue unique career pathways spanning from academia to bio-industry.

Devoted to excellence, innovation, and scholarship in education.
We educate students in the integration of structure and function of cells, organ-systems, and living animals, providing a strong foundation for knowledge discovery in basic science and human health fields.

b. IBP Graduate Program Commitment to Diversity and Inclusion

The IBP Graduate Program embraces the University of Minnesota’s position that promoting and supporting diversity among the student body is central to the academic mission of the University. A diverse student body enriches graduate education by providing a multiplicity of views and perspectives that enhance research, teaching and the development of new knowledge. Higher education trains the next generation of leaders of academia and society in general, and such opportunities for leadership should be accessible to all members of society. We stand for a culture free from racism and discriminatory acts or behaviors against all individuals. We welcome and deeply value each person for their intersecting identities (race, color, ethnicity, age, abilities, sexual orientation, gender identity and expression, religion, faith, spiritual beliefs and veteran status) and lived experiences. The IBP Graduate Program is, therefore, committed to providing equal access to educational opportunities through recruitment, admission, support of programs that promote diversity and foster successful academic experiences that in turn help to cultivate the leaders of the next generation.
c. IBP Department History

The Department of Integrative Biology and Physiology (formerly the Department of Physiology) has a long and distinguished tradition for excellence in research and graduate education. The department was founded in 1889 and achieved national and international prominence in large part through the efforts of Dr. Maurice Visscher during his tenure as Chairman from 1936 to 1968. Dr. Visscher received both his MD and PhD degrees from the University of Minnesota. His pioneering research on cardiac energy metabolism began in Starling’s laboratory in Cambridge and eventually provided a foundation for the development of open-heart surgery techniques at the University of Minnesota. He was a member of the National Academy of Sciences, served as president of the American Physiological Society and as president of the International Union of Physiological Scientists. In recognition of his scientific contributions and his service to the University of Minnesota, an endowed professorship was established in his honor. Dr. Visscher also began another tradition at Minnesota: A tradition of collaboration between the departments of Physiology, Surgery and Medicine that emphasized the importance of understanding basic physiologic mechanisms and applying this knowledge to the development of new approaches in clinical medicine.

This tradition continues today through an interdepartmental graduate program in Integrative Biology & Physiology, which draws upon the expertise of physiologists in both basic science and clinical departments. This program provides a greater range of opportunities and experiences for graduate student training than could otherwise be provided through a single department. It also increases access to state-of-the-art research facilities and equipment in each of these departments to support graduate student and faculty research activities within the program.

In 1999, the Physiology Department moved into its new space in the completely renovated Jackson Hall. Its current location is in both Jackson Hall and the Cancer and Cardiovascular Research Building.

In 2008, Dr. Joseph Metzger became the new department head and shortly thereafter, the Physiology Department changed its name to Integrative Biology and Physiology (IBP) to better reflect its focus on research of Integrative Biology and Physiology.
d. IBP Department Location and Staff Contact Information

| Mailing Address: |
| University Medical School |
| Department of Integrative Biology & Physiology |
| 6-125 Jackson Hall |
| 321 Church Street SE |
| Minneapolis, MN 55455-0250 |
| Phone: (612) 625-5902 |
| [http://physiology.umn.edu](http://physiology.umn.edu) |
| Cancer & Cardiovascular Research Building |
| 2231 6th St. SE |
| Minneapolis, MN 55455 |
| Lobby Info desk: (612) 626-3062 |
| Tina Roman, Accountant |
| 6-129 Jackson Hall, |
| (612) 625-2970 |
| romant@umn.edu |
| Joseph Metzger, Department Head |
| 6-125 Jackson Hall and 3-148 CCRB |
| (612) 625-8296, metzgerj@umn.edu |
| Christopher Denu, HR Generalist |
| 6-145 Jackson Hall, (612) 625-2876 |
| denux002@umn.edu |
| Jop van Berlo, Director of Graduate Studies (DGS) |
| 4-140 CCRB, (612) 626-1853 |
| jvanberlo@umn.edu |
| Jane Mayhew Barnard, Graduate Program Coordinator (GPC) |
| 6-125 Jackson Hall, (612) 624-8151 |
| mayhe001@umn.edu |
| Catherine Kotz, Associate Dir. of Graduate Studies |
| 3-144 CCRB, (612) 301-7687 |
| kotzx004@umn.edu |
| Jean Otto, Department Administrator |
| Building access |
| 6-129A Jackson |
| (612)625-9137, jotto@umn.edu |

e. Graduate Steering Committee

For matters involving setting and implementing policy of the graduate program, the Department has established a Graduate Program Steering Committee, and current members are DeWayne Townsend, Emilyn Alejandro, Catherine Kotz, Tim O’Connell and Jop van Berlo. The committee will also include a student representative who will be an enrolled Ph.D. Candidate in the IBP graduate program for a two-year term. This representative may attend the committee meetings except at those times, in the interests of privacy and confidentiality, the committee may be required to discuss an individual student. This committee, and ultimately the Department Head, will be the Departmental authority on matters of Ph.D. program requirements, policy, curriculum, student performance, and other matters related to the program. However, routine matters such as approval of particular courses in a student’s program, the makeup of a qualifying examination committee, etc., can be approved by the DGS alone. For less routine matters, the committee as a whole may be consulted.
Requirements for a PhD degree from the Graduate Program in Integrative Biology and Physiology

a. Milestones/Requirements

- Completion of core curriculum.
- Maintain a cumulative GPA of at least 3.0.
- Completion of at least three lab rotations.
- Passing the Written Preliminary Exam.
- Selecting an advisor.
- Begin an Independent Development Plan (IDP) which will progress each year.
- Writing an oral thesis proposal.
- Passing the Oral Preliminary Exam.
- Presenting a seminar beginning summer of year 2.
- Meet with thesis committee at least once a year.
- After a committee has been selected, all students must complete the Annual Progress and Review Report Form which will be maintained as a cumulative record.
- Presenting a seminar and chalk talk beginning summer of year 3.
- It is expected that the research of the thesis will be published in at least one peer-reviewed manuscript before obtaining permission to graduate.
- Writing a Ph.D. thesis.
- Passing the final thesis defense.

b. Coursework

Years 1 and 2

Students must complete a minimum of 31 credits of coursework and 24 credits of thesis credits in the IBP PhD program. All graduate students must register for both fall and spring semesters throughout the term of their appointments as Graduate Assistants to maintain active status in the Graduate School. Requests to schedule final oral examinations, for example, will not be honored if a student is considered inactive. If your student status has become inactive, you will need to reapply for admission to the Graduate School.

Register for a minimum 6 credits and a maximum of 14 credits each semester. Students may take elective coursework. Discuss these options with the DGS and advisor. See Appendix B for a listing of potential options. Students are also free to take other coursework as long as it is run past the DGS.

Curriculum Notes: Summer Registration- Students should not need to register during the summer, unless a student needs to do an additional rotation or wants to register for thesis credits during the summer term. Students must contact Grad Education Coordinator for an exception to this policy.

i. Required Coursework: (17)

- ANSC 5702 – Cell Physiology (4)
- BIOC 8401 – Ethics (1)
- PHSL 5101 – Human Physiology (5)
- PHSL 5197 – Stress Physiology (1)
- PHSL 5701 – Physiology Lab TA (2)
- PHSL 8232 – Critical reading – (2)
- PHSL 8242 – Professional Skills Development for Biomedical scientists (grant writing) (2)

Molecular Biology and Genetic Coursework (at least 3 credits).

There are other options listed in Appendix A. The following class has been the most popular.

- GCD 5036 – Molecular Cell Biology (3)
Biostatistics Coursework (at least 3 credits)
There are other options listed in Appendix A. The following class has been the most popular.
PUBH 6450 – Biostatistics (4)

Laboratory Rotations (at least 4 credits)
PHSL 8242 – Research in Physiology (2) take 2 times for a total of 4 – Choose the grade basis S/N

IBP Seminar Series (4 credits)
PHSL 5096 – Integrative Biology and Physiology Research Advances (1) take 4 times for a total of 4
credits. Students need to attend the IBP Seminar Series as often as they are able to throughout
their graduate career.

Thesis Credits (24 credits)
PHSL 8888 – Thesis credit: Doctoral

ii. Laboratory Rotations: Students are expected to complete at least three lab rotations prior to
taking the Written Preliminary Exam. This is the approximate timing of the lab rotations:
• Oct 5 – Dec. 11, 2020
• Jan 4 – March 12, 2021
• March 15 – May 28, 2021

Please note that it is the student’s responsibility to have the rotating laboratory mentor complete the
Lab Rotation Expectations form prior to the start of the rotation and the Rotation Assessment form,
which is completed when the rotation ends. Forms can be found in the Rotation Forms folder in
Google Drive. A delay in form submissions, will delay the student receiving a grade for the course.
When all rotations are complete, student should also complete the lab completion form. See forms
Appendix E – G.

Lab rotations (PHSL 8294) should be taken very seriously since by the end of summer of Year 1,
students must choose a laboratory for thesis work. Minimum level of effort in a rotation is 20 hours
per week. When a student is not in class, IT IS ALWAYS A GOOD IDEA TO BE IN LAB! Use rotations
to make sure the lab is right for you, that you acquire new skill sets, and ensure that your potential
mentor is favorably impressed. If necessary (e.g. in the event none of the laboratories are a good fit
for the mentee), a fourth rotation (over the summer) can be arranged after completion of the
preliminary written exam.

c. Determination of Student’s Progress (Academic Performance Policy)

1. IBP PhD grad students must achieve a B grade or better in both ANSC 5700 (or PHSL 5700), and
PHSL 5101. Failure to achieve a B or better in either class results in academic probation and possible
dismissal.

2. IBP PhD grad students must also achieve an overall GPA of 3.0 or better. Failure to achieve a GPA of
3.0 for one semester would result in academic probation. Failure to achieve an overall GPA of 3.0 or
better for two or more semesters could result in dismissal.

A PhD student is deemed to be making satisfactory progress by completing most or all of their
coursework, passing the PWE and successful completing the Preliminary Oral Examination (POE) within
the first two academic years.
After the second academic year, satisfactory progress is determined by the student’s Thesis Advisor. The Thesis Advisor will inform both the student and the DGS if there are problems. A PhD student in the IBP Graduate Program is expected to earn their degree within four-to-six years from the date of the initial registration in the Graduate School. A PhD student is required to meet with their Thesis Committee at least once each year. During their graduate studies and before being able to defend the thesis, all students must have at least one research paper submitted for publication.

d. Advisor Selection

Year 1
The Director of Graduates Studies (DGS) is the default Faculty Advisor for all new graduate students during the first year, (with the exception of students admitted to the graduate program with a research assistantship provided by a specific faculty member). The DGS can assist students with developing a program of study, selecting a Thesis Advisor. All students are expected to select a Thesis Advisor, who then also becomes their Faculty Advisor, by the end of their first year or first part of the second year. Students are encouraged to speak with different faculty members about their interests and possible research topics. Lab rotations will provide experience for students in three or four labs to make their decision on an advisor. The IBP Graduate Faculty are listed here: z.umn.edu/IBPgraduateFaculty

Once selected, the Thesis Advisor guides students in choosing remaining coursework and thesis research. The Thesis Advisor also provides financial support for their students from their research grants. Students with traineeships should check with the stipulations of the training grant regarding the timing of advisor selection.

Remember that the advisor-advisee relationship is mutual; faculty members must agree to become a student’s advisor. Upon selection of a faculty member and the faculty member’s acceptance of advising responsibilities, students should inform the DGS and the Graduate Program Coordinator of the faculty advisor selection.

e. Written Preliminary Exam (WPE)

End of May, early June after Year 1
Overview and Purpose. The exam will be an essay style format, testing the student’s ability to apply concepts learned in the core courses and integrate these concepts into the ‘big picture.’ Courses covered in the written preliminary exam include: PHSL 5700 Cell Physiology (or ANSC 5700), PHSL 5101 Medical Physiology, and the additional seminar based on reading the literature related to the Med Physiology class (PHSL 8232) in the spring of year one. By studying for and taking the PWE, students are afforded an opportunity to integrate their primary knowledge base. Unsatisfactory performance on the PWE may result in the student leaving the PhD program.

Process. Exam questions in short and long essay format covering ANSC/PHSL 5700 Cell Physiology, PHSL 5101 Medical Physiology, and the additional journal club based on reading the literature related to the Med Physiology class in the Spring of year 1 will take place in the early summer (within 2-4 weeks of completion of the Spring Semester). The PWE takes place over two days and usually has both a morning and afternoon session. Students will be given the specific PWE format and general question areas as well as exam timing about a month before the PWE.

f. Graduate Student Colloquium

Beginning with the summer semester of the second year and thereafter, students are expected to give a 30-minute seminar. Beginning the summer of Year 3, students will give their seminar followed by a chalk talk (30 min). The hour (or more) following your chalk talk is an IDEAL TIME for your thesis committee to meet for the annual progress meeting, which is required at least once per year. Please schedule your
g. **Individual Development Plan (IDP)**
Students are required to meet with Sharolyn Kawakami-Schulz, Director of the Office of Professional Development to begin their IDP. Ideally, this meeting will take place prior to the preliminary oral exam and before year three.

h. **Annual Meeting with Director of Graduate Studies**
Individual annual meetings with the DGS are typically set up in the fall each year as a check-in with students and to discuss the students' individual development plans (IDP). The IDP template is located in the IBP Grad Prog common Google drive.

i. **Submit the Graduate Planning and Audit System (GPAS)**
Spring semester of Year 2
This is an online report, to view a student’s real-time progress toward degree requirements. It is submitted by the student and then approved through a workflow system. After the audit is received by the office of Graduate Student Services and Progress (GSSP), the student will then be able to register for the preliminary oral exam. The Graduate Program Coordinator can guide the student in the audit submission. This is the website for the GPAS: [https://onestop.umn.edu/academics/gpas](https://onestop.umn.edu/academics/gpas).

j. **Assign a Preliminary Oral Committee**
Spring, Year 2 or Fall of Year 3
The student establishes a Prelim Committee consisting of a minimum of four faculty members (at least three from the IBP Department and one cognate member from outside the IBP Department). Students are strongly encouraged to include a fifth committee member so that the committee will be sufficient in number in the event that one member cannot attend the thesis defense. The committee must have a chair (student's Thesis Advisor, except for the thesis defense). Use this UMN One Stop Student Services site to Assign the Prelim Oral Committee.

This committee is intended to monitor progress and help the student in several ways:
1. Evaluate the student’s POE and suggest areas for improvement if needed.
2. Develop a research program suitable for obtaining the PhD degree.
3. Provide guidance during the course of the research and offer suggestions for future directions.
4. Ensure that the quality and quantity of research is suitable for obtaining the PhD.
5. Help the student and Thesis Advisor determine when sufficient research has been completed to prepare the dissertation.

Ideally, the Thesis Committee is formed soon after the student passes the Written Preliminary Exam. The first meeting should be held when the research is still in its early stages. Although the length of committee meetings can vary greatly, it is recommended that approximately 2 hours be set aside for each committee meeting.

**Role of the Thesis Advisor and the Thesis Committee.** Although mentoring styles vary tremendously amongst faculty and depending on the student, a few general comments may be helpful. The PhD research may be considered a collaboration between the student and Thesis Advisor. It is appropriate for the Thesis Advisor to provide substantial input and advice regarding development of the research plan, interpretation of results, and determination of next steps. Although this is a collaborative effort, the student should be the driving force. The committee should provide oversight and feedback and should help the student and Thesis Advisor in development and subsequent modification of the overall research
plan. The committee should not require the student and Thesis Advisor to conduct specific experiments; rather, it should serve in an advisory capacity, and ultimately pass judgment as to whether the research and written thesis are sufficient for obtaining a PhD degree. The student is encouraged to seek input from individual committee members outside the scheduled committee meetings.

See Appendix H for full list of responsibilities of student and mentor/advisor.

k. Scheduling the Preliminary Oral Examination (POE)

End of summer after year 2 or Fall Year 3

Overview and Purpose. Before the POE can be scheduled, students must complete and submit their GPAS for review and approval. Allow 6-8 weeks for the PhD Degree Program to be approved. To schedule the Preliminary Oral Exam, go to this UMN One Stop site Doctoral oral exam scheduling.

Purpose. The Preliminary Oral Examination (POE) must be passed before a student achieves candidacy for the PhD degree. There are four objectives of the POE in IBP:

1. To evaluate a student’s knowledge of physiology in their general area of interest and to test the student’s ability to integrate this knowledge with other areas of physiology;
2. To evaluate the student’s capacity to think creatively and communicate effectively in both oral and written presentations;
3. To provide students with a unique learning experience in written and oral communication and to foster development and expression of scientific creativity;
4. To ensure that students have thesis committee and thesis proposal, and that the thesis committee agrees to the thesis proposal before the student commits to their thesis research.

Process. The DGS and the student’s advisor will help the student to familiarize themselves with guidelines of the Preliminary Oral Examination. Briefly, the process is as follows:

Research Proposal. The student writes a research proposal according to the guidelines of an National Institutes of Health (NIH) pre-doctoral fellowship (see: http://grants.nih.gov/training/F_files_nrsa.htm) The student, in consultation with their advisor, selects a topic and develops the proposal. The scope and area should be suitable for a PhD thesis. The selected topic may represent the student’s planned PhD thesis research. The proposal should contain a hypothesis, specific aims, sufficient background and preliminary data to justify the work, and a general outline of the experimental plan to accomplish the aims. The proposal should be distributed to the Thesis Committee at least two weeks before the meeting to allow time for committee members to digest the information.

Input from advisors. The primary objective of the advisor is to foster the development of scientific creativity and expression and to provide a unique learning experience in written and oral communication. Other objectives are to evaluate a student’s knowledge in their area of interest, to assess the student’s ability to integrate this knowledge to other areas of physiology, and to judge the student’s capacity to think creatively and communicate effectively.

Students should exercise originality and independence in preparing their research proposal. Although proposed experiments and designs should originate with the student, each student is encouraged to seek critical input from their advisor, committee members, other faculty and students. It is acceptable for others to comment on the rationale and justification of the hypothesis, the clarity of the writing, as well as the feasibility of the proposed experimental design, techniques and interpretation of the results. It is not appropriate for a student to copy or include specific aims and experiments that are part of a grant proposal developed previously by the advisor.
Format of POE. The POE begins with a 15 minute presentation of the thesis proposal to the committee. Afterwards, the student’s POE Committee questions the student for up to 2 hours. The student is then excused and the POE committee votes to Pass the student or pursue other courses of action.

The student’s POE Committee typically serves as the Doctoral Thesis Committee but can be changed in consultation with the DGS. It is the student’s responsibility to schedule the exam with the POE Committee members and the Graduate School.

The following regulations apply to the Preliminary Oral Exam:
The POE determines whether the student has mastered the material in their major and minor/supporting fields at a level the committee deems appropriate for advancement to doctoral candidacy. Thus, the examination is not restricted to a discussion of the research proposal but will include questions related to coursework in the major and minor/supporting fields.

The Chair of the POE Committee is responsible for the conduct of the exam, ensuring that the line of questioning is appropriate as well as observing Graduate School procedures. Following the seminar, the POE Committee meets with the student for further questioning. In addition to addressing issues related to the written research proposal and seminar, questioning will also address the student’s general knowledge of physiology, including both molecular and integrative aspects, using the research proposal as a point of reference. The POE Committee then determines the outcome: Pass, Conditional Pass (which will require remedial action), or Fail.

Passing the Preliminary Oral Examination constitutes official candidacy for a PhD degree. There are no further examinations until the final oral defense of the dissertation.

Pass with Reservations. If the student passes the examination with reservations, the student is informed immediately, but the committee is permitted one week in which to convey its reservations to the student in writing, informing the student of the steps that must be taken to remove them. A copy of this letter must be submitted to Graduate Student Services and Progress (GSSP) in Academic Support Resources and should accompany the signed Oral Examination Report Form.

When the student has satisfied the committee’s reservations, a second letter informing the student that the reservations have been removed and that the student may proceed toward the degree is also required. A copy of the second letter must also be submitted to GSSP. Both letters should be written by the committee chair. It is expected that the second letter be submitted no later than 4 months following the preliminary oral examination. The final oral examination may not be held until GSSP has received a copy of the letter indicating that the reservations have been removed.

If the committee members disagree as to whether the reservations have been satisfactorily removed, the committee chair asks for another vote. The results of the second vote are recorded as either pass or fail, with no option for a pass with reservations. A majority of votes indicating that the student has satisfactorily removed the reservations, or a tie vote, constitutes a pass. If the student does not receive a pass on the second vote, the student fails the preliminary oral examination, and his or her doctoral candidacy and student status may be terminated.

Failing the Exam. Failing the Preliminary Oral Examination may result in either a recommendation to repeat the exam, or to be dropped from program.

I. Manuscript requirement
The Graduate Program in IBP recognizes the importance of writing and submitting a manuscript, plus responding to reviewer criticisms, as an essential part of a doctoral student’s scientific training. As a
condition of graduation, it is expected that every doctoral student in the Graduate program in IBP publish at least one original research manuscript about your thesis project.

m. Annual Reviews by Advisors

It is the responsibility of the student advisor to review student’s progress each year. The advisor should review their graduate student and complete a form before the end of year two. After the thesis committee is formed, the student will begin a cumulative review form that the committee and advisor will have input.

n. Thesis Committee Meetings and Annual Reviews

Every year after committee has been formed.

Committee meetings should be held at least once a year or more frequently if considered desirable by the student, Thesis Advisor, or Thesis Committee. The suggested time to schedule these meetings are after the student’s summer seminar. The goal of these meetings is for the student to present recent progress and for the committee to provide input to the student and Thesis Advisor as to whether satisfactory progress is being made, and ultimately to help the student and Thesis Advisor decide when sufficient research has been conducted for writing the PhD dissertation.

One week prior to the meeting, the student should distribute to the committee the Annual Review Form. The student should begin with an oral presentation (PowerPoint recommended) reviewing the material in the form. This should be followed by a discussion and suggestions from the committee. The meeting should end by discussing next steps, goals and setting an approximate date for the next meeting.

Committee Reports

Annual Progress and Review Form

Forms can be found in Annual Review Forms Folder- IBP Grad Prog Google Common Drive

All students must complete the Annual Progress and Review Form, which will be maintained as a cumulative record (i.e. new pertinent information will be added each year) beginning after student has selected a thesis committee. This form should be updated each year then shared with your advisor and committee via Google drive. The purpose of the form is to facilitate communication of each student’s accomplishments and plans to their Thesis Committee and to provide a formal record of the committee’s recommendations for the coming year.

All students must submit their Annual Progress and Review form to their committee at least 48 hours prior to the committee meeting. On the form there are instructions for your thesis advisor to fill in their section and send it to the committee members for their approval following the meeting. It is then signed by the committee chair, student and DGS.

The report should indicate the date of the meeting, committee members in attendance (and absent), and a written narrative describing the events that took place at the meeting. For the first meeting, this report should be sufficiently detailed as to indicate what has been proposed, whether it is feasible and sufficient as thesis research. For subsequent meetings, it should specify progress and if this is sufficient relative to the goals set at the last meeting. It should include any deficits that were identified and recommendations of the committee. This report should also include goals to be accomplished prior to the next meeting and the approximate date of the next meeting.

o. Thesis Defense – Final Oral Examination

Timeline is determined by the advisor, thesis committee and student.
The final step in obtaining the PhD is writing the thesis, defending it in front of the Thesis Committee, and revising it as specified by the committee. Students must adhere to specified formats and timelines in preparing and defending their thesis. Details on formatting and submission can be found here at [UMN One Stop Thesis/dissertation submission and formatting page](#).

Upon written completion of the thesis, the PhD candidate takes the final oral examination in defense of their thesis. The final oral exam may take place only after the written thesis has been judged ready for defense by the thesis committee readers. This exam consists of a public seminar in which the candidate presents their thesis and to which the scholarly community is invited. Students must notify IBP staff at least two weeks prior to their thesis defense and provide them with the title, abstract, date, time and location of their thesis defense so appropriate IBP announcements can be prepared. The information on Final Examination, assigning committee and scheduling the exam is found on this UMN One Stop services site [Graduate Student Service and Progress (GSSP)](#).

A closed meeting between the candidate and the thesis Committee immediately follows the thesis presentation. The candidate is then excused and a vote is taken. The final oral exam is limited to the thesis and relevant subject areas.

The Thesis Advisor is responsible for ensuring the inclusion of appropriate modifications and required revisions, if any, in the final thesis. The final oral exam report form will not be signed and submitted to the Graduate School until all revisions have been made.

There is a more detailed documentation regarding the process of the thesis defense processes and graduation in the Google Common Drive in the Handbooks Folder titled: [Student Thesis Defense Handbook](#).
Policies

a. Academic Standing
Students are expected to maintain a minimum GPA of 3.0 in all their coursework. If a student’s GPA falls below the 3.0 mark, they will be placed on departmental academic probation. If, at the end of a semester, a student’s GPA is below 3.0, that student will receive a letter from the DGS indicating that they have been placed on departmental academic probation. The student will be required to meet with the DGS to develop a remediation plan which may result in dismissal from the program.

b. Vacation
While University regulations specify that there is no official vacation for Graduate Assistants, the IBP Graduate program recommends that all graduate students receive 10 paid days of leave per year. These vacation days may not be accumulated from year to year. Students should consult with their advisor before scheduling vacation time, and any additional vacation time must be negotiated with the student’s advisor. Students who do not yet have an advisor should consult with the Director of Graduate Studies regarding vacation time.

c. Graduate Student Meetings/Leadership
The Graduate Program in Integrative Biology and Physiology has several annual student events and meetings.

- Zofia Zukowska Distinguished Lectureship and Fall Welcome (early September)
- Annual meeting of IBP student body and DGS (late September)*
- IBP Student social event to welcome new students (late September)
- IBP Graduate Program Recruiting Day (late January/early February)
- IBP Student Summer Colloquium
- IBP Grad Program Steering Committee Student Representative (Sr. student, 2 year term)

*Meeting of all the students to decide who will be the representative for each event/meeting.

d. Health Insurance for Graduate Assistants
All new and continuing students holding a fellowship or at least a 25% graduate assistantship will need to complete an application for coverage by the graduate assistant medical plan. See Christopher Denu - (denux002@umn.edu), IBP Human Resource Specialist, 6-145 Jackson Hall for an Application Packet. Submit the Enrollment Form as soon as possible to the Graduate Assistant Insurance Office, N323 Boynton Health Service, 612-625-6936. Students who hold at least a 50% graduate assistantship during both semesters of the academic year, will be covered by the health insurance plan during and the following summer. When you register, students must provide the name of their health insurance provider and their policy number on their registration form, or they will automatically be charged for a University-sponsored hospitalization plan, which is not the same as the plan for graduate assistants. Read the Class Schedule and the graduate assistant health insurance Application Packet for more information. Should a student suffer an injury while fulfilling their duties as a graduate assistant, they must complete an Employee Incident Report form to report the injury and file for worker’s compensation. This must be done as soon as physically possible following the injury. Further information on the policy go to https://policy.umn.edu/hr/workerscomp or see Christopher Denu in Human Resources, 6-145 Jackson Hall for a copy of the form.
e. Serving as a Graduate Assistant and Related Financial Matters

Until the date student-advisor pairings are announced, students will be paid with funds provided by the IBP Department. After a student joins a thesis research lab with a thesis advisor, the student will be paid entirely from their Thesis Advisor's research grant(s). Students continue taking courses and performing research related to the project funded by the grant. Paychecks are issued every other Wednesday. To have your pay deposited directly into your bank account, please complete a Direct Deposit Authorization Form. Students who opt for direct deposit can view their pay statements on line at http://hrss.umn.edu/. All payroll, health and tuition benefit questions should be directed to Chris Denu HR Generalist, 6-145 Jackson Hall, (612) 625-2876.

f. Stipend and Fee Payments

Beginning fall 2020, the graduate student stipend is $33,000 per year plus fringe benefits. Here is an outline of the current financial responsibility for our IBP graduate students:

- Year 1: IBP Department pays stipend and fees  
- Year 2: (when student secures a lab) IBP Department pays stipend, tuition and Mentor pays fees  
- Year 3 to graduation: Mentor pays tuition, stipend and fees.

*Student fees: The cost of this is difficult to predict, as they are dependent on individual situations, including registered credits, international status, etc. An advisor could expect to pay approximately up to $300 a year for a Ph.D. Candidate (1 credit per semester) and up to $1800 for junior level students taking a full semester of credits.


g. Laboratory Safety Training

New graduate students in the IBP Graduate Program must complete two-hours of lab safety training. This training will be offered twice at the start of each fall semester.

Anyone not attending a training session will not be allowed access to the Nils Hasselmo Hall, CCRB or other Laboratories. Dates for training sessions can be found at: http://www.dehs.umn.edu/training.htm

h. Responsible Conduct of Research

The Graduate School mandates that all graduate students receive the equivalent of 8 hours of instruction in Responsible Conduct of Research (RCR). Dates for RCR workshop sessions can be found at the link below: http://cflegacy.research.umn.edu/first/CourseSchedReg.htm.

New graduate students should visit http://www.grad.umn.edu/ethics/ethics_brochure.html. This site is intended to introduce beginning graduate students to RCR concepts; to institutional expectations regarding intellectual honesty and integrity; and to our commitment to provide educational opportunities and resources for students to learn about these topics.

Graduate students in IBP must take at least one formal ethics course related to biomedical research.

Professionalism and Ethics Related Links:
https://research.umn.edu/units/rco
On Being A Scientist: Responsible Conduct In Research an online book (local copy)
i. Equity, Diversity and Inclusion Resources (links)

- BGREAT – Office of Profession Development
- Office or Equity and Diversity
- Graduate School Diversity Office
- Community Scholars Program
- Graduate Students of Color Alliance
- Black Graduate and Profession Student Association (BGAPSA)
- Disability Resource Center
- Women’s Center
- Gender & Sexuality Center for Queer & Trans Life

Where to Ask for Help at UMN Twin Cities

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Prepared by the Communications & Outreach Subcommittee of the Council of Graduate Students Mental Health Wellness Committee

If there is an emergency of any kind, start by calling 911.
Help for Suicidality and Mental Health Concerns
  • 911
  • Student Counseling Service: 612-624-3323
  • Boynton Mental Health Clinic: 612-624-1444
  • Not sure whether to contact the Student Counseling Service or the Boynton Mental Health Clinic? More information on the differences is here: z.umn.edu/CounselingOptions
  • Disability Resource Center: 612-626-1333
  • International Student and Scholar Services: 612-624-7100
  • University of Minnesota Police Department: 612-624-3550
Help for Sexual Assault
  • 911
  • The Aurora Center: legal, medical, academic, and training support for survivors, victims, and individuals concerned about another concerning sexual assault, relationship violence, or stalking
    ○ Mon-Fri 8:00-4:30: text “TALK” to 612-615-8911
    ○ 24-hour Hotline: 612-626-9111
  • Gender and Sexuality Center for Queer and Trans Life: 612-625-0537
  • Kimberly Hewitt, Title IX Coordinator in Equal Opportunity and Affirmative Action: 612-624-9547
  • National Sexual Assault 24-hour Hotline: 1-800-656-4673
  • University of Minnesota Police Department: 612-624-3550
Help for Prejudice and Hate Crimes
  • 911
  • University of Minnesota Police Department: 612-624-3550
  • Equal Opportunity and Affirmative Action: 612-624-9547
  • The Aurora Center: legal, medical, academic, and training support for survivors, victims, and individuals concerned about another concerning sexual assault, relationship violence, or stalking
    ○ Mon-Fri 8:00-4:30: text “TALK” to 612-615-8911
    ○ 24-hour Hotline: 612-626-9111

Help for Access, Disability, or Mental Health Accommodations
  • Disability Resource Center: reports that over half of students they work with list mental health as their primary disability: 612-626-1333
  • Help for Students who are Parents
  • Student Parent Help Center: 612-626-6015
Help for International Students
  • International Student and Scholar Services: 612-626-7100
  • Multicultural Center for Academic Excellence: 612-624-6386
  • Student Cultural Centers: Second floor of Coffman Union
Help for LGBTQ Students
  • Gender and Sexuality Center for Queer and Trans Life: 612-626-6015
  • Trevor Project Helpline (https://www.thetrevorproject.org) which is especially LGBT-focused: Text “Trevor” to 202-304-1200 or call the 24-hour Helpline: 866-488-7386
Help for Students of Color
  • Office for Diversity in Graduate Education: 612-625-6858
  • Equal Opportunity and Affirmative Action: 612-624-9547
Help for Women
  • Women’s Center: 612-625-9837
  • Kimberly Hewitt, Title IX Coordinator in Equal Opportunity and Affirmative Action: 612-624-9547
Help for Professional and Student Conflicts
  • Student Conflict Resolution Center: 612-624-7272
Help for Academic Stress & Support
  • Student Counseling Service: 612-624-3323
  • Writing Center: 612-626-7579 Disability Resource Center: 612-626-1333
Help for Complex Cases & Coordination of Services
  • Emily O’Hara, Care Manager at the Office for Student Affairs: 612-625-2517
```
j. Sexual Misconduct Statement

Sexual misconduct subverts the mission of the University, and threatens the careers of students, faculty, and staff, and will not be tolerated in the Graduate Programs of the Medical School. The 2017 Board of Regents policy defines sexual misconduct as "unwelcome conduct of a sexual nature under either of the following conditions:

(a) When it is stated or implied that an individual needs to submit to, or participate in, conduct of a sexual nature in order to maintain their employment or educational standing or advance in their employment or education (quid pro quo sexual harassment).

(b) When the conduct: (i) is severe, persistent or pervasive; and (2) unreasonably interferes with an individual's employment or educational performance or creates a work or educational environment that the individual finds, and a reasonable person would find, to be intimidating, hostile or offensive (hostile environment sexual harassment)."

All University members are prohibited from engaging in, or assisting or abetting another's engagement in, sexual assault, sexual harassment, relationship violence, stalking, and related retaliation (collectively "prohibited conduct").

Information and guidance regarding sexual harassment are available from the Office of Equal Opportunity and Affirmative Action, which is also the office for complaints of sexual misconduct. All inquiries are held in strict confidence. See the current University Policy for more details.

The Minneapolis St. Paul Campus Title IX officer is Tina Marisam, and her contact information is: (612) 626-9357, marisam@umn.edu. Information about resources for personal support that are available to individuals who believe they have experienced prohibited conduct, as well as answers to questions including those listed below can be found at https://policy.umn.edu/hr/sexharassassault#faqlink.

- Who can I call for help? Are there any confidential resources available to me?
- Can the University provide me with any accommodations or protective measures? What about my housing situation and my classes?
- Do I have to initiate a University investigation if I have experienced prohibited conduct?
- Is there a time limit for initiating an investigation?
- Is it possible for a complainant to remain anonymous during an investigation?
- Who can explain the investigation process to me?
- Are there resources on campus that can support me through the investigation process?
Appendix A
Molecular/Cellular Biology/Genetics Options

BIOL 4003 - Genetics
(3.0 cr; = [GCD 3022]; Prereq-[BIOC 3021 or BIOC 4331], [any CBS major or major in [animal science or applied plant science or BA biology or BA microbiology or nutrition or physiology or biology/society/environment] or #; fall, spring, summer, every year) Introduction to the nature of genetic information, its transmission from parents to offspring, its expression in cells/organisms, and its course in populations.

*Fall MW, 1:00 or TUTH 4:30 or MWF 8:30 - Spr MWF 12:35 or MWF 2:15

BIOL 4004 - Cell Biology
(3.0 cr; Prereq-[3021 or BIOC 3021 or BIOC 4331], [4003 or BIOC 4332]; fall, spring, summer, every year) Processes fundamental to cells. Emphasizes eukaryotic cells. Assembly/function of membranes/organelles. Cell division, cell form/movement, intercellular communication, transport, secretion pathways. Cancer cells, differentiated cells.

BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems
(4.0 cr; Prereq-[BIOL 1002 or BIOL 1009 or BIOL 2003 or equiv], [CHEM 2302 or equiv] or #; fall, spring, every year) Advanced survey of structure/catalysis, metabolism/bioenergetics.

BIOC 4332 - Biochemistry II: Molecular Mechanisms of Signal Transduction and Gene Expression
(4.0 cr; Prereq-4331 or #; spring, every year) Advanced survey of molecular biology, mechanisms of gene action, and biological regulation.

* 4000 level courses listed above only by permission of DGS and advisor.

BIOC 6021 - Biochemistry
(3.0 cr; = [BIOC 3021]; Prereq-general biology, organic chemistry, #; intended for MBS students; fall, spring, summer, every year) Fundamentals of biochemistry. Structure/function of proteins, nucleic acids, lipids and carbohydrates. Metabolism, regulation of metabolism. Quantitative treatments of chemical equilibria, enzyme catalysis, and bioenergetics. Chemical basis of genetic information flow.

GCD 5036 - Molecular Cell Biology**
(3.0 cr; Prereq-Biol 4004 or #; [sr or grad student] recommended; fall, every year) Modern, integrative approaches combining cell/molecular biology, biochemistry, and genetics to investigate cell organization/function. Membranes, signaling, extracellular matrix, secretion, endocytosis, cytoskeleton, nucleus. Analysis of scientific papers to illustrate new concepts in and experimental approaches to cell organization/function.

**Preferred option according to student survey.
Statistics Options

STAT 5021 - Statistical Analysis
(4.0 cr; = [ANSC 2211, ESPM 3012, STAT 3011]; Prereq=: 3011; College algebra or #; Stat course recommended) Intensive introduction to statistical methods for graduate students needing statistics as a research technique. Fall and Spring (Lec: MWF 10:10, Lab: Tu 8:00 or 9:05) Note: This has not been the favorite stats class according to our student survey.

PUBH 6414 – Biostatistical Literacy
3.0 cr. Develop ability to read/interpret statistical results in primary literature. Minimal calculation. No formal training in any statistical programming software. Biostatistical Literacy will cover the fundamental concepts of study design, descriptive statistics, hypothesis testing, confidence intervals, odds ratios, relative risks, adjusted models in multiple linear, logistic and Poisson regression, and survival analysis. The focus will be when to use a given method and how to interpret the results, not the actual computation or computer programming to obtain results from raw data. Fall/spring

PUBH 6450 – Biostatistics I**
4.0 cr; Gaussian probability models, point/interval estimation for means/proportions. Hypothesis testing, including t, chi-square, and nonparametric tests. Simple regression/correlation. ANOVA. Health science applications using output from statistical packages. Fall, (Lec: TuTH 1:25-3:20, Lab: M 9:05 or 12:20; Tu 12:20 or 5:45pm; W 9:05 or 12:20pm) or lec/lab online
Spr (Lec: MW 10:10-12:05, Lab: M 9:05 or W 12:20 or lec/lab online)

PUBH 6451 - Biostatistics II
(4.0 cr; Prereq-[[6420, 6450] or [6414, 6415]] with grade of at least B, health sciences grad student] or #). Two-way ANOVA, interactions, repeated measures, general linear models. Logistic regression for cohort and case-control studies. Log linear models, contingency tables, Poisson regression, survival data, Kaplan-Meier methods, proportional hazards models. Spr only (MW, 10:10-12:05 or online)

**Preferred option according to student survey.
Appendix B

Supporting Program (electives) Courses Options

Students can request to take other courses than listed below. Check with DGS.

**BIOMEDICAL ENGINEERING**

**BMEN 5001** - Advanced Biomaterials
(3.0 cr; Prereq-3301 or MatS 3011 or grad student or #; A-F or Aud, fall, every year) Commonly used biomaterials. Chemical/physical aspects. Practical examples from such areas as cardiovascular/orthopedic applications, drug delivery, and cell encapsulation. Methods used for chemical analysis and for physical characterization of biomaterials. Effect of additives, stabilizers, processing conditions, and sterilization methods.

**BMEN 5041** - Tissue Engineering
(3.0 cr; Prereq-IT upper div or grad student or med student or #; fall, spring, every year) Fundamentals of wound healing and tissue repair; characterization of cell-matrix interactions; case study of engineered tissues, including skin, bone marrow, liver, vessel, and cartilage; regulation of biomaterials and engineered tissues.

**BMEN 5101** - Advanced Bioelectricity and Instrumentation
(3.0 cr; Prereq-[IT upper div, grad student] or #; spring, offered when feasible) Instrumentation, computer systems, and processing requirements for clinical physiological signals. Electrode characteristics, signal processing, and interpretation of physiological events by ECG, EEG, and EMG. Measurement of respiration and blood volume/flow.

**BMEN 5102** - Bioelectric Measurements and Therapeutic Devices II
(3.0 cr; Prereq-5101 or #; spring, every year) Theory/application of electrical stimulation in areas of therapeutic/functional neuromuscular stimulation and pain control, cardiac pacing, defibrillation, tissue healing, and electrotherapy. Safety of electric fields. Electrical tissue impedance measurements.

**BMEN 5351** - Cell Engineering
(3.0 cr; Prereq-[2501 or 5501], CSCI 1107, [Math 2243 or Math 2373], [IT upper div or grad student or #]; fall, spring, offered when feasible) Engineering approaches to cell-related phenomena important to cell/tissue engineering. Receptor/ligand binding. Trafficking/signaling processes. Applications to cell proliferation, adhesion, and motility. Cell-matrix interactions.

**PHARMACOLOGY**

**PHCL 5110** – Introduction to Pharmacology
(3.0 cr; Prereq-Grad student or #; A-F or Aud, fall, every year) Basic principles of Pharmacology. Focuses on molecular mechanisms of drug action

**PHYSIOLOGY COURSES**

**PHSL 4021** - Advanced Physiology and Bioengineering: Bionic Human
(3.0 cr; Prereq-3061 or 3063 or 5061 or #; A-F only, spring, every year) "Six million dollar man" theme used to present physiology of different organ systems. Human organs versus advanced synthetic devices. Artificial heart, kidney, lung. Eye versus digital camera. Artificial intelligence of pattern recognition. Web-based course.

**PHSL 5095** - Problems in Physiology
(1.0 - 5.0 cr [max 20.0 cr]; Prereq-#; fall, spring, summer, every year) Individualized study in physiology. Students address selected problem through library or lab research, supervised by physiology faculty.
PHSL 5211 – Physiology of Inflammation in Disease
(3.0 cr; Instructor consent, PHSL 3051, 3061, MICB 4131 are recommended but not required); every spring

PHSL 5444 - Muscle
(3.0 cr; = [BIOC 5444]; Prereq-3061 or 3071 or 5061 or BioC 3021 or BioC 4331 or #; spring, every year) Muscle membranes: structures, mechanisms, and physiological roles of channels/pumps. Muscle contraction: force generation by actin/myosin.

PHSL 5510 - Advanced Cardiac Physiology and Anatomy (Short Course)
(2.0 - 3.0 cr [max 2.0 cr]; Prereq-#; spring, every year) Fundamental concepts, advanced topics related to clinical/biomedical cardiac physiology. Lectures, laboratories, workshops, anatomical dissections. Intense, one week course, in early January.

PHSL 5525 - Anatomy and Physiology of the Pelvis and Urinary System (Short Course)
(1.0 - 2.0 cr [max 2.0 cr]; Prereq-#; spring, every year) Fundamental concepts and advanced topics related to Pelvic Physiology. Lectures, laboratories, workshops, anatomical dissections. Intense, 3-day course, in early January.

PHSL 8222 - Central Regulation of Autonomic Function
(3.0 cr; =[NSC 8222]; Prereq-NSC 5561 or #; A-F or Aud) Neural/hormonal sensory pathways affecting central autonomic nuclei involved in maintenance of homeostasis. Current research on physiological control systems at cellular, organ, and integrative levels. Offered fall of odd-numbered years. This class is not offered every year.

PHSL 8252/NUTR 8620 – Obesity Prevention, from the molecule to the bedside –
(2.0 cr; This course will cover research topics in obesity prevention at a graduate level. Starting with second week, a professor will review a topic area, and a student will present one assigned refereed research paper in the area, to be discussed by the class. All students will submit a weekly written critique of the manuscript, prior to the discussion.

**BIOMEDICAL NEUROSCIENCE**

NSC 5540 -Advanced Survey of Biomedical Neuroscience (Short Course)
(2.0 cr; Prereq-#; intended for members of biomedical community or students with advanced scientific backgrounds; summer, every year) Current topics in biomedical neuroscience, accompanied by supporting, fundamental concepts. Intensive, one week course.

**METABOLISM**

GCD 4134 - Endocrinology
(3.0 cr; Prereq-Biol 3211 or Biol/BioC 3021 or BioC 4331 or #) Survey of structure and function of invertebrate and vertebrate endocrine systems.

BIOC 8006 – Biochemistry: Metabolism and Control
(2.0 cr; Enzymology of metabolism, metabolic regulation, metabolic control and cell signaling. Second half of term.

**OTHER**

BIOL 8100 – Improvisation for Scientists. 1 cr. Fall sem
### Year 1

**Fall Semester**
- ANSC 5700 – Cell Physiology
- PHSL 8294 – Lab rotations
- PHSL 5096 – Seminar
- GCD 5036 – Molecular Cellular Biology *(possible Molecular/cell course)*

**Spring Semester**
- PHSL 5101 – Medical Physiology
- PHSL 8294 – Lab rotation
- PHSL 5096 – Seminar
- BIOC 8401 – Bioethics
- PUBH 6450 – Biostatistics *(possible Stats course)*

**Summer**
- PHSL 8242: Grant writing or Year 2

### Year 2

**Fall Semester**
- ANSC 5701 – Physiology lab TA
- PHSL 5096 – Seminar
- NSC 5561: Systems Neuroscience *(possible elective course)*
- PHSL 8888: thesis credits

**Spring Semester**
- PHSL 5096 – Seminar
- PHSL 5197 – Stress Physiology
- PHSL 8888: thesis credits

**Summer**
- Give seminar
- PHSL 8242: Grant writing or Year 1

### Year 3

**Fall Semester**
- PHSL 8888: thesis credits

**Spring Semester**
- PHSL 8888: thesis credits or PHSL 8444 if successfully passed Oral Prelims

**Summer**
- Give seminar & chalk talk

### Year 4 & 5

**Fall Semester**
- PHSL 8444

**Spring Semester**
- PHSL 8444

**Summer**
- Give seminar & chalk talk

### Notes:
- Doctoral degree = 55 credits – a minimum of 31 graduate-level course credits and a minimum of 24 thesis credits (PHSL 8888). MD/PhD students can use some of their MD coursework as transfer credits for their GPAS submission.
- After successfully passing the Oral Preliminary Exam, students can register for 1 credit of PHSL 8444. (This is an Advanced Doctoral status that can be taken only after all coursework, thesis credits and Preliminary Oral Exam has been completed. No other credits can be taken with PHSL 8444).
- Each term, students should register for a minimum of 6 credits, 14 is the maximum.
# Appendix D

## Sample MD/PhD Curriculum

### YEAR 1

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td><strong>Fall Semester</strong></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>ANSC 5700</td>
<td>Cell Physiology</td>
<td>4</td>
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<tr>
<td></td>
<td>PHSL 5096</td>
<td>Seminar</td>
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</tr>
<tr>
<td></td>
<td>PUBH 6450</td>
<td>Biostatistics</td>
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<td>(possible biostats option)</td>
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<tr>
<td></td>
<td>PHSL 8888</td>
<td>Thesis credits</td>
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<tr>
<td><strong>Spr Semester</strong></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>PHSL 8232</td>
<td>Critical Reading</td>
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<tr>
<td></td>
<td>PHSL 5096</td>
<td>Seminar</td>
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</tr>
<tr>
<td></td>
<td>PHSL 8888</td>
<td>Thesis credits</td>
<td></td>
</tr>
<tr>
<td><strong>Summer</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHSL 8888</td>
<td>Thesis credits</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHSL 8242</td>
<td>Prof Skills Dev for Bio-Medical scientists (grant writing)</td>
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### YEAR 2

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
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<td><strong>Fall Semester</strong></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>PHSL 5701</td>
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<td></td>
<td>(optional)</td>
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<tr>
<td></td>
<td>PHSL 8888</td>
<td>Thesis credits</td>
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<tr>
<td><strong>Spr YR 2 and Beyond</strong></td>
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<tr>
<td></td>
<td>PHSL 8444</td>
<td></td>
<td>1</td>
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<td><strong>Summer</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Give Seminar &amp; Chalk Talk</td>
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</table>

### Notes:
- IBP Doctoral degree = 55 credits – a minimum of 31 graduate-level course credits and a minimum of 24 thesis credits (PHSL 8888). MD/PhD students can use some of the Medical school coursework as transfer credits.
- After successfully passing the Oral Preliminary Exam, students can register for 1 credit of PHSL 8444. (This is an Advanced Doctoral status that can be taken only after all coursework, thesis credits and Preliminary Oral Exam has been completed. No other credits can be taken with PHSL 8444).
- Each term, students should register for a minimum of 6 credits, 14 is the maximum.
Appendix E

GRADUATE PROGRAM IN INTEGRATIVE BIOLOGY AND PHYSIOLOGY

Laboratory Research Rotation
Goals and Expectations

DATES OF ROTATION:
ROTATION MENTOR:
ROTATION STUDENT:

Brief description of rotation project and expectations of Mentor:

Please return to:
1) Jop van Berlo, jvanberl@umn.edu and Jane Barnard, mayheOO1@umn.edu
2) Rotating student
Appendix F

Graduate Program in Integrative Biology and Physiology

Laboratory Research Rotation
Assessment Form

Dates of Rotation:
Rotation Mentor:
Rotation Student:

Please give grade for rotation (S/N):

Brief description of rotation project and expectations of mentor:

Brief assessment of the success of the rotation (please include strengths and weaknesses of the student):

Please return to:
1) Jop van Berlo, jvanberl@umn.edu and Jane Barnard, mayhe001@umn.edu
2) Rotating student
Appendix G

GRADUATE PROGRAM IN INTEGRATIVE BIOLOGY AND PHYSIOLOGY
LAB ROTATION COMPLETION FORM

**Student Name:**

<table>
<thead>
<tr>
<th><strong>Rotation 1</strong></th>
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<tr>
<td><strong>Lab Rotation Mentor</strong></td>
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<tr>
<td><strong>Start Date:</strong></td>
<td><strong>End Date:</strong></td>
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</table>

<table>
<thead>
<tr>
<th><strong>Rotation 2</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lab Rotation Mentor</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Start Date:</strong></td>
<td><strong>End Date:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Rotation 3</strong></th>
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<td><strong>Lab Rotation Mentor</strong></td>
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Please send the completed form to Jane Barnard (mayhe001@umn.edu)
Appendix H

Roles and Responsibilities of the Thesis/Dissertation Advisor

Faculty and graduate students share complementary responsibilities in the maintenance of academic standards and the development of high-quality graduate programs. These are basic roles and responsibilities guidelines that advisors follow:

1. Provide clear direction for the requirements each student must meet and policies of the graduate program.
2. Advise graduate students as to how to develop a program plan, including appropriate course work, research or project activity, and available resources.
3. Ensure that each graduate student initiates thesis or dissertation research in a timely fashion.
4. Provide training and oversight in creative activities, research rigor, theoretical and technical aspects of the thesis or dissertation research, and professional integrity.
5. Create supervisory relations with students that stimulate and encourage students to learn creatively and independently, and respect the academic freedom for students to express options that may differ from those of faculty.
6. Encourage graduate students to stay abreast of the literature and cutting-edge ideas in the field.
7. Help graduate students to develop professional skills in writing reports, papers, grant proposals and evaluating manuscripts and papers; encourage participation in professional meetings; help establish professional networks/professional contacts for the benefit of students; to develop interviewing skills.
8. Provide regular feedback on the progress of graduate students toward degree completion, including feedback on research or creative activities, coursework, teaching, and provide constructive criticism if the progress does not meet expectations.
9. Acknowledge student contributions in research presented at conferences, in professional publications, or in applications for copyrights and patents.
10. Practice uncompromising honesty and integrity according to university and federal guidelines in reporting of data in manuscript submissions.
11. Make provisions for supervision and advising of graduate students when the Faculty Advisor is on leave or extended absence.
12. Help graduate students develop into successful professionals and colleagues, including encouraging students to participate and disseminate results of research or creative activities in the appropriate scholarly or public forums.
13. Facilitate career development, including advising graduate students on appropriate job and career options, as well as on the preparation of application materials for appropriate fellowship, scholarship, and other relevant opportunities.
14. Write letters of reference for appropriate fellowship, scholarship, award, and job opportunities.
Roles and Responsibilities of the Student

These are some basic roles and responsibilities guidelines that students should follow:

1. Adhere to and take responsibility for learning university and academic unit rules, procedures, and policies applicable to graduate study, research or creative activities.
2. Meet university and academic unit requirements for degree completion.
3. Recognize that in many disciplines, the Faculty Advisor provides the intellectual and instructional environment in which the student conducts research, and may, through access to teaching and research funds provide the student with financial support.
4. Respect faculty member’s need to allocate their time and other resources in ways that are academically and personally productive.
5. Devote an appropriate amount of time and energy toward achieving academic excellence and earning an advanced degree in a timely fashion.
6. Acknowledge the contributions of the Faculty Advisor and other members of the research team to the student’s work in all publications and conference presentations.
7. Follow disciplinary and scholarly codes of ethics in course work, thesis or dissertation research, and in creative activities.
8. Practice uncompromising honesty and integrity according to university and federal guidelines in collecting and maintaining data.
9. Seek regulatory approval for research in the early stages of thesis or dissertation work where applicable.
10. Take initiative to communicate regularly with Faculty Advisor(s) on progress toward completion of the thesis or dissertation.
11. Work cooperatively with supervising faculty and Teaching Assistants (TA) to accomplish the tasks set out in TA assignments.
12. Give adequate attention to the teaching role by conscientious efforts in planning, preparation, and implementation of TA assignments.
13. Achieve an appropriate balance between teaching responsibilities and other essential activities.

For further information see UMN Policy Library: 
Guidelines for Mutual Roles and Responsibilities for Faculty & Graduate Students
Appendix I

DEGREE COMPLETION STEPS

Doctor of Philosophy
Doctor of Education

Students eligible to use the Graduate Planning & Audit System (GPAS) will follow the degree completion steps below. Contact Graduate Student Services and Progress (GSSP) if you are unsure whether you are completing your degree using the Graduate Planning & Audit System or the paper Graduate Degree Plan.

In order to receive your degree, the following steps must be completed. You must maintain active student status by registering every fall and spring semester until your degree is awarded. Contact your program advisor for program-specific requirements and deadlines.

1. Submit Graduate Planning & Audit System (GPAS) planner
   Submit at least one semester prior to your preliminary oral exam.

2. Assign members to preliminary oral exam committee
   Complete at least one semester prior to exam at: https://onesstop.umn.edu/examination-committees

3. Complete Preliminary Written Exam
   Program staff report results to GSSP. Must be on file with GSSP to be authorized to take preliminary oral exam.

4. Schedule preliminary oral exam
   Notify GSSP of scheduled exam at least one week in advance.

5. Submit Preliminary Oral Report
   Submit for your record to reflect doctoral candidacy.

6. Assign members to doctoral final exam committee
   Complete at least one semester prior to exam at: https://onesstop.umn.edu/examination-committees

7. Download Graduation Packet
   Packet will include the Graduate Application for Degree form and Reviewers’ Report form.

8. Schedule doctoral final exam
   Notify GSSP of scheduled exam as soon as the date is set but no later than one week in advance.

9. Apply to Graduate
   Apply to graduate no later than the first day of the anticipated month of graduation. Application instructions are available: https://onesstop.umn.edu/academics/apply-graduate

10. Submit Reviewers’ Report
    Submit prior to your defense.

11. Submit Doctoral Final Exam Report
    Submit no later than the last business day of anticipated month of graduation.

12. Submit dissertation/project
    The dissertation must be submitted and approved by GSSP by the last working day of the anticipated month of graduate. Please plan accordingly. Consult Graduation Packet for formatting guidelines. https://onesstop.umn.edu/thesisdissertation-submission-and-formatting

Questions? Contact Graduate Student Services and Progress office (333 Bruininks Hall)

gssp@umn.edu
(612) 625-3490
https://onesstop.umn.edu/contact-gssp

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