

Department of Physiology Graduate Program

POLICIES AND PROCEDURES

(Established April 1, 1977)

(Policy revision(s) approved September 2023)

MS Plan C added 09/01/2022)

The Department of Physiology of Wayne State University provides programs of graduate study leading to the degrees: Doctor of Philosophy (Ph.D.); Doctor of Philosophy with a concentration in the Reproductive Sciences; and Master of Science (M.S.). The doctoral program is designed to train individuals to do basic research in physiology in an academic or industrial environment and to teach physiology. The master's program is designed primarily to prepare individuals for a doctoral program and to perform basic physiological research. The Department of Physiology has no graduate program of study for students not seeking advanced degrees.

I. Admission

- A. Applications should be completed by April 1st each year for admission into the graduate program for the subsequent fall semester. Applications will be considered at any time during the academic year. **If seeking funding, completed applications should be received by February 15th.*
- B. Applications should include:
 1. Completed University and Departmental graduate application forms. **<https://gradslate.wayne.edu/apply/>**
 2. Official Transcripts from all colleges or universities the applicant has attended. (for non-English institutes-official translation must accompany transcripts)
 3. Honor point average (H.P.A.; basis of 4.0 = A)
 - a. Minimum G.P.A. of 3.0 for consideration for Ph.D. program.
 - b. Minimum G.P.A. of 2.75 for consideration for M.S. program.
 4. Coursework: Consideration for acceptance includes evaluation of performances in undergraduate biology, mathematics through calculus, physics, inorganic and organic chemistry courses.
 5. Applicants are encouraged (but not required) to include the Graduate Record Examination (GRE) scores in their admission application
 6. Three letters of recommendation.
 7. Interviews. Whenever possible, applicants are encouraged to arrange interviews with members of the Departmental Graduate Committee (D.G.C.) as well as faculty in area of research interest.
 8. Doctoral applicants having a M.S. degree must submit a copy of their thesis. The thesis will be returned.
 9. TOEFL exam results are required for international students.
 10. Proof of research experience is helpful but not required (publications in which you are listed as an author).

II. Degree Requirements

A. Coursework

1. Doctor of Philosophy (Ph.D.) & Doctor of Philosophy with a Concentration in the Reproductive Sciences (RPS)
 - a. Basic Graduate Physiology Lectures (PSL 7011 & 7031, 4 credits each semester)
(When PhD students are required to take 7011 and 7031, they must attain at least a "B" grade

(80% competency) in the course and pass each section of physiology. Failure to meet both of these standards will require students to repeat the course or repeat specific sections of the course, as directed by the Graduate Committee). (Revision approved: May 2019; DFC)

- b. Basic Integrative Physiology Laboratory (PSL 7020 & 7040, 2 credits each semester)
- c. PSL 7060 (1 credit, F & W)
Students are required to take PSL 7060 during fall and winter semesters until they successfully pass the Written Qualifying Examination (WQE). Advanced students are encouraged to continue to participate. (Revision approved: September 2023; DFC)
- d. One graduate level course in molecular biology (MBG 7010) and one graduate level course in biochemistry (BMB 7010). *The student may elect to take IBS 7015 Molecular and Cellular Biology (7 credits) which would satisfy both courses.*
- e. Biostatistics (FPH 7015) or equivalent
- f. Graduate Level Cell Biology (Addition approved: August 2012; DFC)
- g. Minimum of 3 elective advanced physiology courses. **[Does not include Special Problems (PSL 7880); PSL Seminar (PSL 7890); Arranged Research (PSL 7996)].** These elective hours must include courses selected from the following areas of Physiology outside area of research specialty. (RPS students must take 10 credits of RPS courses)
 - PSL 7215 Nanobiotechnology (3 credits)
 - PSL 7400 Adv. Respiratory Physiology (2 credits)
 - PSL 7420 Organizing & Communicating Hypothesis Testing in Physiology (2 credits)
 - PSL 7550 Adv. Renal Physiology (2 credits)
 - PSL 7600 Adv. Cardiovascular Physiology (2 credits)
 - PSL 7640 Cell & Molecular Physiology (3 credit)
 - PSL 7660 Neurophysiology (3 credits)
 - PSL 7680* Endocrinology (4 credits)
 - PSL 7685* Reproductive Physiology Seminar (1 credit) **[cannot be used to satisfy Adv. Requirement; cannot be used to satisfy PSL 7890 requirement]**
 - PSL 7690* Principles of Reproductive Biology (2 credits)
 - PSL 7700* Embryonic Stem Cell Biology (3 credits)
 - PSL 7710* Disease States and Reproduction (1 credit)
 - PSL 7730* Reproductive Science: Teratology (3 credits)
 - PSL 7740* Developmental Systems in Reproductive Biology (3 credits)
 - PSL 7770* Perinatal Biology and Reproduction (2 credits)
 - PSL 7775* Current Research Topics in the Reproductive Sciences (2 credits)
 - PSL 7825 Membrane Physiology: protein transport, lipid metabolism and human diseases (2 credits)
 - PSL 7910* Readings in Molecular Male Reprod & Chromatin Systems Biol. (1 credit)
- *RPS Advanced Courses**
- h. Physiology Seminar (PSL 7890) - PhD students are required to enroll for 2 credits. It is mandatory that **All** graduate students attend **All** seminars. Students, who are not registered for PSL 7890 credit, must verify their attendance on a sign-up sheet or notify the graduate officer prior to the seminar of an excused absence. Experiments should be planned around regularly scheduled seminars, unless endorsed by the faculty advisor. Students who violate this policy will not be eligible for yearly graduate student achievement or travel awards. All PhD *candidates* will be expected to give a seminar in our departmental seminar series prior to their defense. (Revision approved: December, 2018; DFC)
- i. Minor - At least six (6) credit hours of multidisciplinary courses other than physiology. Must be graduate level basic science courses.
- j. Total of sixty (60) course credit hours.
- k. Doctoral Research - Thirty (30) credit hours in Doctoral Research and Direction (in 7.5

credit units.

I. Scholarly Publications and Graduate Research Fellowship: (Addition approved: August 2009; revised October 2021)

It is expected that each student that enters the PhD program will be first author on no less than one scholarly paper published in a peer-reviewed journal. Failure to do so may delay graduation. In addition, each student that enters the PhD program is expected to write and submit a graduate research fellowship.

The Department of Physiology encourages students to discuss early on with their mentor the impact that publishing prior to graduation has in advancing academic or industry career development. We also encourage students to discuss with their mentor if additional opportunities to publish different types of manuscripts (e.g. Review Article, Rapid Report, Innovative Methodology, Point-Counterpoint) are available, particularly if original research articles will be limited to one publication. (addition approved by FC: 7/31/2020)

Graduate research fellowships are designed for graduate students to develop into productive independent research scientists. Students that are awarded a fellowship receive both mentored training and financial support during completion of their dissertation research. The Department of Physiology encourages students to discuss early on with their mentor the benefits of writing a graduate research fellowship and how the experience will be of benefit while pursuing job opportunities in academia or private industry. (addition approved by FC: 10/12/2021.)

2. Master of Science (M.S.)

- a. Basic Graduate Physiology Lectures (PSL 7010 & 7030, 4 credits each semester)
- b. PSL 6300 Biotechnology: Tech & Appl. (2 credits: F).
- c. Advance Physiology Coursework (See list of advanced course in section II:A:1:g.)
[Does not include Special Problems (PSL 7880); PSL Seminar (PSL 7890); Arranged Research (PSL 7996)]

Plan A: Minimum of four (4) elective **hours** in other advanced physiology courses.

Plan C: Four Advanced Physiology **courses** for a minimum of 8 credits

- d. Seminar (PSL 7890) - M.S. students are required to take 1 credit. It is mandatory that **all** graduate students attend **all** seminars. Students, who are not registered for PSL 7890 credit, must verify their attendance on a sign-up sheet or notify the graduate officer prior to the seminar of an excused absence. Experiments should be planned around regularly scheduled seminars, unless endorsed by the faculty advisor. Students who violate this policy will not be eligible for yearly graduate student achievement or travel awards. (Addition approved: August 14, 2018; DFC)
- e. Minor requirement: a minimum of 2 courses (4 credits) of graduate level non-physiology coursework.
- f. **Plan A:** Total of twenty-two (22) course credit hours.
Plan C: Total of thirty (30) course credits
- g. Thesis research **Plan A only** (PSL 8999) - eight (8) credit hours.

B. The Qualifying Examinations

1. Written Qualifying Examination (WQE) (*revision approved Jan 2014-FC; clarifications approved Jan 2017 -FC*):

Part 1 is a short grant-like proposal in an area of the student's interest.

- The "proposal" would include Background and Significance, Specific Aims with one or more supporting hypothesis, a Brief Experimental Design (for a total of ~6 pages) and Literature Cited.
- To encourage teamwork and collegial interactions, students will be encouraged to talk to others in constructing their project *however the submitted proposal must be the student's original work.*

- Submit it to the Graduate Committee two weeks before Part 2.

Part 2 consists of a *presentation* given by the student on the proposed project. The talk would be given in front of interested students and an Examination Committee composed of physiology faculty appointed by Graduate Committee of the Department of Physiology.

- *The purpose of the presentation is to give students the opportunity to demonstrate an understanding of the proposed project, the underlying scientific structure and rationale, and its relationship to basic concepts of human and animal physiology.*
- In this session anyone in the audience would be permitted to ask questions and thus examine the student about:
 - the proposal itself
 - molecular, cell, and systems physiology, directly or indirectly related to the broad background of the student's research area
- A member of the Graduate Committee will act as moderator for the student presentations to ensure that the examination of the student proceeds respectfully and fairly.

The Examination Committee will meet privately immediately following the student's presentation to decide whether, in the opinion of the Examining Committee, the student demonstrated competency at the level expected for a second-year student in:

- *constructing and evaluating a hypothesis driven research proposal*
- *explaining the scientific reasoning that ties their research proposal to their core knowledge of molecular, cellular and systems physiology*
- *understanding core concepts of molecular, cell, and systems physiology*

A majority of the Examination Committee present at the exam must vote in favor of the student to pass the exam (a quorum of three [3] is required).

A passing performance *will* be based on a consideration of both the written document and the student's ability to orally present the proposal and to answer general questions posed by the faculty and students. *The student's scores and the final recommendation of the Examination Committee will be presented to the Graduate Committee who will make the final decision on the student's performance.*

If the student shows the ability to think and reason in an effective manner and has a good general understanding of physiology, but demonstrates weakness in one or more areas of molecular, cell, and/or systems physiology, the student can be given a conditional pass with the requirement that they successfully complete specified coursework and/or a specified plan of study that addresses the identified areas of concern. Such courses and/plan of study must be completed within the following year.

If the student does not demonstrate the readiness to think and reason in an effective manner and/or does not demonstrate the expected general understanding of basic physiology, the student will be given a second opportunity to take the exam one month later.

If, after the second exam, the student is able to demonstrate that he/she can think and reason in an effective manner, but still has a weakness in an identified area of physiology, they *may* be given a conditional pass. This conditional pass would be contingent on the student successfully complete specified coursework and/or a specified plan of study that addresses the identified areas of concern. Such courses and/plan of study must be completed within the following year.

If after the second exam the student is not able to demonstrate adequate competency both in scientific reasoning and basic knowledge of physiology, the student will be instructed to finish the requirements for a MS degree in Physiology.

Note: It is not expected that: the students will be experts in the proposed area of research; the proposed project would be competitive for funding in its present form; the student will already be performing at the level expected for a Ph.D. defense; or the student correctly answer every question to the level expected by members of the audience

2. Oral Portion of Qualifying Examination (Ph.D. Students) (revised: approved 1/7/09; DFC)
Oral Qualifying exam: consists of a 40-50-minute presentation of the student's proposed

research for their Ph.D., to be followed by discussion with members of the student's Advisory Committee. At least 2 weeks prior to the oral presentation, the student must distribute their completed research prospectus in the form of a grant (i.e. NIH pre-doctoral grant application) to the members of their Advisory Committee. Upon the committee's acceptance of the prospectus, the student will be allowed to schedule the Oral Qualifying Examination.

The qualifying examination must be completed no later than 30 months after a student enters the Ph.D. program.

C. Research - The Department of Physiology offers only research-oriented degrees. Master's (Plan A) and doctoral students must prepare and defend a thesis of excellent quality.

D. Research Rotation (changed: approved 8/11/09; DFC; updated: 5/8/12 DFC)

All new students are required to choose an advisor by June 10 of their first year. To facilitate this process, it is suggested that incoming students review the research interests of the faculty before their arrival at WSU and interview the faculty during September of their first semester. If the student has not selected a mentor by the end of September and had that selection approved by the DGC, they will be required to begin the first of 3 possible rotations. The rotations will continue until a mentor has been selected and approved. The site of each of the rotations will be determined by mutual agreement between the student and the faculty member with the approval of the Graduate Officer and/or the DGC.

The rotations are as follows:

1. 1st rotation - begins October 1st and concludes at the end of the fall semester. The student will be required to work at least 12 hours per week in a lab for the duration of this 10-week period and will be given a project that can be reasonably concluded during the rotation. For this 1st rotation the student must register for PSL 7996 during the fall semester.
2. 2nd rotation will be during the first 10 weeks of the winter semester (12 hours per week for 10 weeks). For the 2nd rotation, the student must register for PSL 7996 during the winter semester
3. 3rd rotation will begin in the 11th week of the winter semester and continue until June 1 (12 hours per week for 10 weeks). For the 3rd rotation, the student will register for PSL 7996 during the spring semester.

Notes:

- For the rotations PSL 7996 is for 1 credit per semester.
- Students will be allowed to disengage at any time during the rotation process if they have found a suitable mentor and laboratory to do their PhD research. The decision to remain with a faculty advisor must be a mutual decision by the student and the mentor and be approved by the DGC.
- Mentors will provide a written evaluation of each rotation for the student's file.
- The above timetable assumes that a student is entering the PhD program during the fall semester. For students who are entering at other times of the year, the above schedule will be adjusted accordingly to preserve the above sequence and schedule.

By the end of the rotation period, every student is required to obtain a faculty advisor for their dissertation research based on mutual agreement. Students unable to do so will result in dismissal from the Physiology Graduate Program.

III. Student, Adviser, and Advisory Committees

A. Advisor

1. Temporary advisor: The DGC may assign each incoming student a temporary advisor at the time the student is accepted into the graduate program in Physiology. Beginning October 1 of the student's first year, the faculty member in charge of the student's rotation will serve as the student's temporary advisor. The temporary advisor will introduce the student to the university and the department and advise him or her on coursework and research opportunities and provide opportunities to begin research in his or her laboratory.
 2. Research Advisor: The student is encouraged to select a research advisor in the Physiology Department who best suits the student's professional development and research interest. The research advisor may be, but need not be, the student's temporary advisor. A student must select a research advisor by June 10 of their first year. This selection is by mutual agreement between the student and the faculty member and must be approved by the DGC. The requirement that DGC must approve the selection of an advisor also extends to students that enter the graduate program in Physiology by means of the MD/PhD program.
- B. Advisory Committee (revision: approved 5/8/12 DFC)
1. Doctoral Examination Committee: Doctoral students, including those in the MD/PhD program, in consultation with their advisors select no less than four faculty for membership on the student's doctoral committee. If the student's research is not with a member of the Physiology the minimum committee membership is 5. There must be **three** members that hold 'Regular' Graduate Faculty appointments (one of which must be the student's advisor or co-advisor). Including the advisor, there must be three committee members from Physiology who have their primary academic appointment in the Department of Physiology. One member must be from outside the Department of Physiology. The advisor will serve as the graduate examiner and report directly to the graduate school. Constitution of the doctoral committee must be approved by the DGC and the Graduate School. This committee must meet at least annually to discuss the direction and progress of the student's research. In most cases it would be helpful for the committee to meet twice a year. The doctoral student's advisor must submit a written summary of this annual meeting to the DGC no later than October 1 of each year.
 2. Master's Examination Committee (Plan A only): Master's students in consultation with their advisors select no less than three faculty for membership on the student's committee. The student's mentor must hold a 'Regular' graduate faculty appointment. The majority of the committee must be from the physiology department. The committee must be formed prior to the defense of thesis and be approved by the DGC.

IV. Requirements for Advancement to Candidacy Status

- A. Doctoral student
1. Completion of departmental basic coursework (See: Degree Requirements a-g).
 2. Satisfactory performance on both the written competency examination and the oral qualifying exam (Refer to Section II. B.).
 3. Approval of Advisor and an approved Plan of Work on file with the Graduate School.
Submission of Plan of Work to the Graduate School; this must be done prior to completion of 40 hours of graduate coursework.
 4. Approval of outline of research by DGC.
 5. Satisfactory completion of oral qualifying examination.
 6. Approval of petition for change of status by advisor, departmental graduate committee, and graduate school.

***PhD STUDENTS CANNOT REGISTER FOR PSL 999x (DISSERTATION RESEARCH) UNLESS THEY HAVE OBTAINED CANDIDACY STATUS.**

B. Master's student (Plan A only)

1. Fulfill requirements listed in section II. A. 2. a.-e.
2. Approval of Plan of Work and petition for change of status by advisor, DGC and graduate division.

V. Dissertation and Defense

Students shall follow guidelines established by the Graduate School and printed in the Graduate Bulletin in preparing the doctoral dissertation or master's thesis. When the dissertation is approved by the advisor, a complete copy of the dissertation must be distributed to each member of the examining committee at least two weeks in advance of the public defense. The doctoral dissertation defense (public final oral) shall be open to the public and information shall be posted at least two weeks prior to the dissertation defense. (M.S. thesis defenses are closed to the public).

VI. Interdisciplinary Degree Program (Doctoral degree awarded by two or more University departments)

1. Students will be admitted into the program under the same policies as departmental graduate students.
2. Formation of interdisciplinary doctoral committee composed of at least two members from the Department of Physiology.
3. Interdisciplinary programs must be approved by each departmental graduate committee and University Graduate division.
4. Satisfactory completion of competency examination or similar written examination conducted by interdisciplinary committee and approved by the Physiology Graduate Committee.
5. Interdisciplinary students must fulfill requirements listed above in Section II. A. 1.a, c. (minimum of 4 elective hours in Advanced Physiology courses), d. and B.
6. Take a minimum of 2 credit hours of seminar in Physiology or other basic science with a minimum of 1 credit hour in Physiology.
7. Complete thirty credit hours of dissertation research (PSL 999X or equivalent).
8. Any other requirements established by interdisciplinary committee.

VII. M.D./Ph.D. Program

Guidelines are established by the Wayne State University School of Medicine for admission into this program. It is expected that all doctoral requirements described in this policy statement will be met with the exception that the student **may be** exempted from the basic departmental coursework (PSL 7011-PSL 7040 sequence).

VIII. Teacher Training Activities

All graduate students are required to participate in departmental teaching activities whether or not they are on fellowships.

IX. Petition and Recommendation Sequence

Responsibility for individual graduate programs and progress towards degree is recognized to reside in the following sequence of individuals and committees. Recognition of any inadequacies can be made at any level and appeals for clarification or correction shall follow the order given.

1. Student
2. Advisor
3. Doctoral Committee (Ph.D.)
4. Departmental Graduate Committee [Full Committee]
5. Departmental Chairman [Dr. J-P Jin]

6. Medical School Graduate Office [Dr. Daniel Walz]

APPENDIX

I. Departmental Graduate Committee (revised: 10/12/10 DFC)

The Departmental Graduate Committee shall be composed of five (5) members of the full-time departmental graduate faculty and the departmental graduate officer (serving as chairman). The departmental graduate officer is appointed by the departmental chairman who is also an ex-officio member of the committee. Normal tenure on this committee is for three (3) years. The function of the departmental graduate committee is to recruit and admit graduate students, evaluate the student's progress in their academic endeavors, and make necessary recommendations in the interest of the student's scholarly growth. All decision shall be based on a majority vote. The committee also makes recommendations to the departmental chairman and the physiology faculty-at-large on matters of policy and procedure of the graduate program.

II. Financial Aid

The Departmental Graduate Committee shall recommend to the graduate officer students or prospective students for financial assistance. Appropriate action will be taken upon approval by the committee. A student or prospective student who has applied to a professional program shall not ordinarily be offered financial support. In the event a student receiving financial assistance applies to a professional program, financial support can be terminated by the committee. Students will be considered for Assistantship support under the following criteria. Students entering with a bachelor's degree and applying for a Master's Degree will not be considered for stipend support. Students entering the Ph.D. program who already hold a M.S. (or equivalent degree) will be eligible for stipend support consideration. Ph.D. entering students without advanced degree experience will be eligible for stipend support consideration.

- A. Graduate Research Assistants **may not** hold other positions within or outside the University without prior written permission of their Department Chairman, the Dean of their School, and the Graduate School. It is the responsibility of the Assistant to determine whether or not the prior written approval has been obtained before engaging in any additional service agreement. (Addition: recommended 5/4/11 DGC; approved 5/10/13/10 DFC)

III. Placement

Information regarding post-degree training and job opportunities will be made available to graduating students. Departmental faculty and staff are encouraged to make information concerning such positions available to the graduate officer.

Appendix

GRADUATE STUDENT PROFESSIONALISM*:

While 'professionalism' can encompass a variety of characteristics depending on the environment, for the Physiology Graduate Program, terms such as *commitment and confidence*, *responsibility and dependability*, and *honesty and ethics* are the qualities we expect from all our students.

Commitment and Confidence - Acting professionally starts with commitment to your graduate program.

This commitment develops out of a desire to build and maintain a reputation as a professional -- to seek and follow advice of your mentor and program administrators, and to seek training and development for career growth. Professionals convey confidence in their program, their role within their department, and in themselves.

Commitment and confidence instill trust and credibility.

Responsibility and Dependability - Acting responsibly and fair in all program activities and to all departmental members is critical to professionalism. Responsible behavior has an impact across all career fields and domains. In an academic environment, a professional is organized, honors their commitments, is dependable, and communicates respectfully and timely to all mentors, colleagues, and administrators.

Responsibility and dependability instill trust and credibility.

Ethics and Honesty - Ethics and professionalism go together. A professional not only looks and acts the part; they do so with legal, ethical, and honest intent. Truth, open disclosure, and sincerity are paramount to ethical professionals. Professionals make a commitment to their career by developing a personal code of conduct. As a student in our graduate program, we expect you to demonstrate a commitment to honesty and an ethical code of conduct.

Ethics and honesty instill trust and credibility.

(WSU Student Code of Conduct can be found at: <https://doso.wayne.edu/pdf/student-code-of-conduct.pdf>)

*(Adapted from Neil Kokemuller's article 'Characteristics of Professionalism' on Career Trends website.)