

Doctoral Student Handbook

Ph.D. in Applied Physiology

School of Biological Sciences

Georgia Institute of Technology

(Fall 2017)

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1. **INTRODUCTION**

1.1. PURPOSE

This handbook has been prepared for doctoral students in the Applied Physiology PhD program at the Georgia Institute of Technology (Georgia Tech). It will acquaint graduate students with some of the regulations and procedures of the School that relate to the doctoral graduate program. It provides details specific to Applied Physiology and is intended to be a supplement, not a substitute, for other Georgia Tech resources including:

Georgia Tech General Catalog: <http://www.catalog.gatech.edu>

Graduate Studies & Research website: <http://www.grad.gatech.edu>

Questions or clarifications regarding material presented in this handbook should be addressed to your advisor and/or Ms. Adrienne Durham, Academic Program Coordinator, School of Biological Sciences, 555 14th Street, NW, Room 1358, telephone – 404-894-7658, email – Adrienne.durham@biosci.gatech.edu.

1.2. INDIVIDUAL ACADEMIC PLAN

Doctoral study is inherently unique to each student. Each student is expected to work closely with his or her advisor to define a set of coursework, a path of academic research, and other academic activities that will prepare the student for a career in teaching and independent research. The following guidelines are intended to encourage steady progress toward that goal.

⇒ Upon matriculation (typically fall semester) each student should:

Meet with their faculty advisor and prepare a preliminary Program of Study (see Appendix A: Program of Study form and course plan)

Discuss financial support options and responsibilities

Identify a potential area of research according to your interests and those of the faculty advisor

Register for core courses and electives (see Appendix B)

⇒ By the end of the second semester each student should meet with their advisor to discuss the following:

Who will serve on your Doctoral Advisory Committee (DAC). Refer to section 5.3 regarding selection of the five faculty who will ultimately advise your research. At least three faculty members should be identified by this time to prepare for the Qualifying Examination.

Final Program of Study determined.

Further define your line of research and what financial support might be available during your time as a graduate student.

⇒ By the end of the third semester (fall semester of 2nd year) each student should meet with their advisor and achieve the following:

Confirm completion or on track to complete all core courses

Plan for the Qualifying Exam by coordinating test preparation with Doctoral Advisory Committee and establishing official exam date with the AP Graduate Committee (exam is normally administered in January-February).

Together with your Doctoral Advisory Committee finalize the academic plan of course work, insuring that all School requirements will be met. The final Program of Study form must be approved by the advisor and forwarded to the AP Academic Program Coordinator for signature by the Program Director.

⇒ By the end of the fourth semester each student should have passed the Qualifying Exam and begun preparation for the Oral Proposal Presentation.

⇒ By the middle of the fifth semester (fall semester of 3rd year) each student should have successfully completed their Oral Proposal Presentation and be formally admitted to Candidacy for Doctoral Study.

1.3. MILESTONE PLAN

The course of doctoral study is punctuated by specific milestones, each of which represents the culmination of multiple academic and administrative requirements.

Milestone	Requirements
Matriculation	Attend Georgia Tech and Applied Physiology orientations Attend GTA orientation & International student orientation, if required Prepare a preliminary Program of Study with your advisor Complete online Responsible Conduct of Research course within 90 days of the first semester as a PhD student (http://rcr.gatech.edu/online-training)
Qualifying Exam (Jan-Feb of 2 nd yr)	Complete core curriculum, maintaining a 3.0 GPA Approved Program of Study signed by AP Graduate Committee (AP-GC) Establish your Doctoral Advisory Committee (DAC)
Oral Proposal Presentation	Distribute written proposal to DAC (3 weeks before presentation) Inform AP Academic Program Coordinator of presentation (2 weeks before)
Formal Admission to Candidacy Thesis Defense	After successful oral proposal presentation, file request for Admission to Candidacy with the Office of Graduate Studies File Doctoral Minor Form with Office of Graduate Studies File Degree Petition with Registrar (middle of graduation semester) Distribute written thesis to DAC (3-4 weeks before defense) Inform AP graduate office of presentation (2 weeks before) After successful defense, file the following (Office of Grad Studies): <ul style="list-style-type: none"> • Thesis • Certificate of Thesis Approval • Library and UMI Information • Doctoral Dissertation Agreement Survey of Earned Doctorates Applied Physiology Exit Survey

2. PH.D. PROGRAM – UNIVERSITY REGULATIONS

2.1. REGISTRATION

During the week preceding first registration, each new student should meet with their faculty advisor to select courses for the initial academic term and to receive instructions regarding the academic calendar and the scheduling of classes. The Online Student Computer Assisted Registration is known (by its acronym) as OSCAR. Complete instructions on how and when to register and how to access OSCAR can be found at:

Registrar's Office webpage: <http://www.registrar.gatech.edu/registration>

OSCAR homepage: <http://oscar.gatech.edu>

Prior to fall registration, Georgia Tech conducts an orientation and expo for all incoming graduate students. All new doctoral students in Applied Physiology are expected to attend. It is recommended that you register for orientation online at:

Graduate Student orientation: www.gradadmiss.gatech.edu/orientation-gradexpo

Reminder about Student Health: Before registering all new students must 1) submit Medical Entrance Forms to Student Health Services, and 2) either purchase the GT insurance plan or show proof of health insurance: <http://health.gatech.edu/eligibility/insurance>

Reminder for International Students: All new international students must check in with the Office of International Education as soon as they arrive (<http://www.oie.gatech.edu>).

Adding/Dropping

You can drop and/or add classes using OSCAR (see link above). Changes may be made to your schedule provided the allotted time for terminal registration has not expired. In general, you have until the last day of Phase II registration to add and/or drop classes without penalty. There is no refund of fees for dropped courses. Dropping a class after the mid-point of the semester is not permitted.

Payment of Fees

Students must pay tuition and fees each semester at the Bursar's Office by the posted deadline. If fees are not paid, your registration will be canceled. Typically, tuition and fees are due on the last day of Phase II Registration. Payments may be made through the mail by check or money order, in person at the Bursar's Office by cash, check, money order, or credit card, and over the phone or fax by credit card.

2.2. COURSE LOAD

A full-time course load for graduate students is **at least 12 credit hours** on a letter-grade or pass-fail basis. The **maximum load** for graduate students in good standing is **21 hours in fall/spring** and **16 hours in summer**.

Students with fellowships, assistantships, traineeships, tuition waivers, or student visas are required to enroll full time (12 credit hours). This also applies to students who are assigned to Georgia Tech by the armed forces for the purpose of pursuing a degree.

No more than one course (up to 3 hours) may be audited during the fall and spring semesters, and two courses (up to 6 hours) on an audit basis for summer semester.

Full-time doctoral students working primarily on thesis research should register for 18 or more hours of the 9000 course (Doctoral Thesis) in fall and spring semesters, and for up to 16 hours during summer semester.

Beginning full-time doctoral students, especially those who are research assistants, are encouraged to register for at least 3 hours of 9000. This allows these students to begin laying the groundwork for Ph.D. research.

Part-time doctoral students engaged in research for the Ph.D. should register for the number of 9000 hours consistent with the time they and their faculty advisors spend on the dissertation research.

A student may register for only one hour of 9000 during the semester of graduation. This exception may be used only once for the degree.

For additional information, go to: <http://www.policylibrary.gatech.edu/student-affairs/policy-hour-loads-graduate-students>

2.3. TRANSFER CREDITS

A doctoral student normally does not request transfer credit since the degree is not driven primarily by credit hours. However, in some cases, first-year graduate students with previous graduate credit not acquired at Georgia Tech may wish to obtain transfer credit for that work, up to 6 semester hours maximum. Graduate courses taken at an institution accredited by a Canadian or U.S. regional accrediting board that were not used for credit toward another degree may be considered for transfer credit. Students who wish to be considered for transfer credit should obtain transcripts and syllabi for the appropriate courses to be reviewed and approved by the AP-GC. In consultation with their advisors, the courses will be evaluated if they are germane to the program of study. The subsequent procedures are detailed at: <http://www.catalog.gatech.edu/rules/14/>

2.4. LEAVE OF ABSENCE

A student desiring to take a one-semester (fall/spring) leave of absence must obtain written approval from their advisor and the chair of the AP Graduate Committee. However, if a student is not enrolled for two consecutive semesters, including summer term (e.g., fall & spring or spring & summer), he/she must reapply to Georgia Tech through Graduate Studies. Readmission will be based on Program approval.

2.5. ACADEMIC DISMISSAL

The AP Graduate Committee is responsible for monitoring all doctoral student records and as part of this process, to set academic criteria for dismissal. To remain in good standing, a doctoral student in Applied Physiology must maintain a GPA of 3.0 while making progress toward the Ph.D. Student performance will be reviewed at the end of every term. As necessary, a student will be notified and counseled by their advisor regarding any concerns that may lead to academic dismissal. If satisfactory academic performance is not being met, the student will be placed on probation and be permitted one semester to rectify the situation. If, at the end of this period, the student has not

successfully met the criteria established by the AP-GC, the student is subject to dismissal. Failure to maintain good standing following the term of probation will result in ineligibility for departmental GTA or GRA support. Additionally, the AP-GC will follow all Georgia Tech guidelines regarding other matters that may lead to dismissal. The student always has the right to appeal to the AP-GC.

2.6. READMISSION

Students who interrupt the continuity of their graduate programs by not registering for two or more consecutive terms must seek readmission by filing with the registrar a completed request for a readmission form.

The readmission application, with all the pertinent supporting information (except possibly another college transcript), must be submitted to the registrar before the deadline for the term for which readmission is requested: fall – July 1, spring – December 1, summer – April 1.

2.7. RESIDENCY REQUIREMENT

Doctoral students must spend at least two full-time semesters in residence at the Georgia Institute of Technology and ordinarily must complete research for the dissertation while in residence. Under special circumstances, candidates who have met the residency requirement may receive permission to pursue their research in absentia, provided the chair of the school approves and a faculty member directs the project. Doctoral students working full-time on thesis research should normally be registered for a full course load of 9000 level dissertation hours each semester. Although no minimum number of 9000 level dissertation hours is set at the Institute level, this requirement is at the discretion of the advisor and the department. A minimum of 12 thesis hours are required for a PhD in Applied Physiology. Doctoral students must be registered in the semester of graduation (<http://www.policylibrary.gatech.edu/student-affairs/policy-hour-loads-graduate-students>).

2.8. FINAL EXAM POLICY

Generally, no exams (including final exams) are given during the last week of the semester. The official final exam schedule may be found on the OSCAR web site as soon as the semester schedule is available. If a student has an exam conflict identified by the Institute (two exams at the same time or three exams in one day), then the student must bring this conflict to the attention of the faculty as soon as possible so that faculty members can accommodate the student in determining an alternative exam time. In the case of three exams in one day, the middle exam is the one that the student should reschedule with the specific instructor.

There is no policy against offering an alternative final exam time during final exam week if the faculty member thinks it would be helpful to the students. However, this alternative final exam time must be OPTIONAL for each student. If a student does not want to take the final exam at the alternative time for any reason, it is the student's right to be given

the final exam at the regularly scheduled time or at a time that the instructor and student can mutually agree upon.

3. DEGREE REQUIREMENTS

3.1. PROGRAM OF STUDY

3.1.1 PHILOSOPHY

Formal coursework is intended to provide students with foundational knowledge needed to make meaningful contributions to the advancement of scientific knowledge and is highly tailored to the individual student's interests and goals. The structure of this individualized training program is embodied in the Program of Study, which each student should prepare upon matriculation into the program, in consultation with an academic advisor, before registering for classes. Advisement should continue each semester using the Program of Study as a guiding document. The program may be revised during the student's career, but changes should be approved prior to registering for classes: the goal is not to restrict student choice, but to ensure academic cohesion and rigor. The Program of Study is composed of four sections: Core Coursework, a Minor Field of Study, a Focus Area, and Thesis Hours. The Program of Study will be reviewed by the AP Graduate Committee for appropriate breadth, depth, and overall academic rigor and approval will require signatures from the student's advisor, the AP Graduate Committee and the Program Director.

Graduate-level courses taken as part of another degree or at another institution may be used to satisfy some Program of Study requirements, although academic credit for those courses is not transferrable (see Section 2.3). Students wishing to use coursework from another institution to satisfy Program of Study requirements must submit a syllabus (in English) and transcript with the Program of Study. The AP Graduate Committee will review these courses in the context of their contribution to a rigorous and cohesive Program of Study in Applied Physiology.

3.1.2 CORE COURSEWORK

All students in the Applied Physiology Ph.D. program will be required to take **five core courses for a total of 15 credit hours** on a letter grade basis during their first two years of graduate study. These courses are:

- a. AP 6211, 6212, 6213 Systems Physiology I, II & III (3 hr/semester = 9 hr)
- b. AP 6225 Biostatistics (3 hr)
- c. AP 8000 Doctoral Seminar (3 hr)

Students must satisfactorily complete all core courses before they are eligible to take the oral qualifying examination. The AP Graduate Committee will review any petitions to exempt these courses based on equivalent work. Students may begin taking elective courses approved by their faculty advisor prior to completion of these core classes.

3.1.3 MINOR FIELD OF STUDY

As per Georgia Tech guidelines, in addition to adequate knowledge in their major field of intended research, the student must demonstrate mastery of another body of knowledge – the minor field, preferably outside the student's school. The purpose of the minor is to

encourage a more diverse interest on the part of the student and to provide a broader basis for the evaluation of their capabilities. The **minor field of study will consist of at least 9 credit hours** of work in related courses, agreed upon by both the student and their advisor. Once the student has satisfactorily completed the minor requirement as required by the Institute, the appropriate form (download from the Georgia Tech website) must be completed in the School office with a copy sent to the Office of Graduate Studies for final approval and recording prior to graduation. Minor field of study courses must be completed on a letter grade basis and should include non-APPH courses. The courses should be at the 6000 level or above, but use of certain 4000 level courses may be appropriate.

3.1.4 FOCUS AREA

In addition to the core courses (15 credit hours) and the minor (9 credit hours), each student is required to take **6 credit hours in their focus area** (for example, biomechanics). These courses must be approved by the student's advisor. A maximum of 3 hours of 4000 level courses can apply to the focus area. **No Special Problems hours can apply to the Focus area.** Focus area courses must be completed on a letter grade basis.

3.1.5 DISSERTATION HOURS

In addition, registration for Doctoral Dissertation hours (9000) should begin with the student's initial term and continue throughout doctoral study. Dissertation hours are broadly interpreted to reflect all stages of the doctoral dissertation – literature review, topic selection, experimental/theoretical preparation, research performance, writing and presentation. In consultation with their advisor, first year students will be advised to register for only a few hours of 9000 (e.g., 3-6 hr). In contrast, advanced doctoral students who are working primarily on their dissertation research should register for 18 or more hours in fall and spring semesters and for up to 16 hours of 9000 for summer semesters. Full time doctoral students are expected to commit to an intensive research program, and should register for thesis hours to reflect maximal effort.

3.1.6 SUMMARY OF COURSE REQUIREMENTS

MINIMUM DEGREE REQUIREMENTS	CREDIT HOURS
SYSTEM PHYSIOLOGY SEQUENCE (6211-6213)	9
BIostatISTICS	3
SEMINAR (APPH 8000), PHIL 6000 (or equivalent)*	4
APPROVED MINOR	9
FOCUS AREA	6
DISSERTATION*	<u>12</u>
TOTAL	43

*Mandatory RCR Academic Policy for ALL DOCTORAL STUDENTS

- complete an online RCR course within 90 days of their first semester as a PhD student

(<http://rcr.gatech.edu/online-training>)

- complete PHIL 6000 or a program's "in-house" RCR training approach

<http://rcr.gatech.edu/doctoral-courses>

NOTES: A maximum of 3 credit hours of Special Problems and 6 hours of 4000 level courses may be counted toward PhD course requirements.

*12 hours of 9000 is simply the minimum required for the Ph.D.; typically the number of dissertation hours accrued during full-time doctoral study will be in the range of 40-80. Students should register for the maximum 21 hrs each semester by filling out their schedule with APPH 9000 Dissertation.

3.2. ADMISSION TO CANDIDACY

Doctoral students customarily apply for degree candidacy after completing at least three semesters of coursework. To qualify for candidacy, students must:

- 1) complete all core courses
- 2) achieve a satisfactory scholastic record (minimum GPA of 3.0 with no grade of 'C' or below in core courses)
- 3) pass the oral qualifying examination
- 4) pass the oral proposal presentation

Upon completion of these requirements, the student should formally apply for degree candidacy by completing the Request for Admission to Ph.D. Candidacy form, obtaining Committee members' signatures and submitting the form to the Office of Graduate Studies (<http://www.grad.gatech.edu/theses-dissertations-forms>).

Procedures associated with the oral qualifying exam and oral proposal presentation are described in the next sections.

3.3. ORAL QUALIFYING EXAM

3.3.1. Eligibility

Each Ph.D. student is expected to take the qualifying exam at the beginning of the student's fourth academic semester of study. Students must have a satisfactory scholastic record (minimum 3.0 GPA with no grade of 'C' or below in core courses) consistent with an approved Program of Study. Qualifying exams for second year students will typically be held during the first two weeks of spring semester.

3.3.2. Exam Philosophy

The purpose of the oral qualifying exam is to assess understanding and application of general systems physiology principles to questions related to the student's focus area. It is a critical step in ensuring that the aspiring doctoral student can integrate graduate-level courses and experiences – including classes, seminars, lab experiences, and outside reading – in a logical and analytical manner.

The qualifying exam is an opportunity for students to demonstrate their ability and competency by articulating responses to a series of questions developed by members of their Exam Committee. The goal of the exam is to test the student's general preparedness in areas related to applied physiology before moving forward with a concentrated research effort. It may also help define further training or experiences that would enhance the student's preparation.

The exam is NOT simply a cumulative exam over previous coursework, nor an opportunity to critique specific research results. Nor is its purpose to test the student on the details of the dissertation project since this will be addressed during the oral proposal presentation (and ultimately the final oral defense).

The committee will evaluate the correctness of the students' responses as well as judge the overall level of breadth, depth, and integration of the students' responses. Clarity and conciseness of the presentation of responses is very important.

3.3.3. Exam Committee

The exam will be an oral examination administered by a faculty committee consisting of three Program faculty. The student's thesis advisor will nominate the Qualifying Exam Committee Chair. The balance of the committee will be selected by the AP Graduate Committee.

The thesis advisor is encouraged to attend the exam as an observer. He/she may not make comments during the exam, unless requested to do so by a committee member. The committee may solicit input from the advisor after the student has been dismissed. The thesis advisor will not be present while the committee is making its final decision on the student's Qualifying Exam performance.

3.3.4. Procedures Prior to the Exam

No less than 6 weeks prior to the exam, the Program Director will announce the exam dates and ask each eligible student to provide a one-page resume of his/her academic background and research work to-date and a completed course of study. The student is discouraged from embellishing this resume in such a way as to give Qualifying Exam Committee members inaccurate expectations of his/her experience. This material and a transcript will be provided to the Qualifying Exam Committee.

No less than 4 weeks prior to the exam, the AP Graduate Committee will inform each eligible student of the composition of his/her Qualifying Exam Committee.

No less than 2 weeks prior to the exam, the student will meet with the exam committee chair to discuss the philosophy of the exam, the mechanics of the exam and any other points the student or committee chair deem appropriate. The student is encouraged to meet individually with his/her other committee members prior to the exam.

Neither the chair nor the committee members will discuss specific exam questions with the student.

The chair of the exam committee will request initial exam questions from the committee members. It will be the responsibility of the exam committee chair to ensure that questions are fair and cover the intent of the exam as outlined above. The exam committee chair should ensure that the questions are appropriate given the student's research and coursework to date. These should be distributed to the committee members before the exam.

The scheduling of the qualifying exam date and time will be handled by the Program administration. Exams for all second year students are typically held prior

to the second week of the spring semester. If an exam must be rescheduled, the exam committee chair is responsible for finding a time within the exam period suitable to all other committee members, the student, and the advisor. The Academic Program Coordinator must be notified immediately of the new exam time and location.

3.3.5. Procedures the Day of the Exam

It is the student's responsibility to bring extenuating circumstances (such that the exam should not be held) to the Qualifying Exam Committee chair's attention before the exam begins.

The committee will meet alone for 5 minutes to discuss the order and scope of the exam. An exam will typically last 90 minutes, and sufficient time should be provided to each committee member to ask questions.

During the exam, the exam committee chair has the responsibility of ensuring that the exam proceeds on time and within scope.

The advisor's presence is solely to ensure that the student received a fair examination. The advisor should not volunteer any information nor ask any questions unless it relates directly to the conduct of the exam.

At the end of questioning, the student is dismissed. The committee may solicit comments from the advisor. The advisor will then be dismissed and the exam committee will discuss the student performance and resolve the exam outcome by ballot. The vote to pass or fail the student will be based on the student's exam performance only.

There will be only one vote taken. This vote is binding and conducted by the exam committee chair. Each committee member must make a final decision prior to the voting, as there will not be a second vote. The voting must take place prior to the exam committee's adjournment. No voting will take place after the adjournment, by e-mail or otherwise.

The chair of the exam committee has the discretion to limit the length of the committee's discussions.

Each committee member must complete an evaluation form with appropriate comments at the end of the exam. The exam chair is expected to deliver the evaluations to the school office. The Program Director uses these evaluations to assess whether the student is meeting the program objectives and to provide additional feedback to the student and advisor regarding the exam performance.

If the vote is an unconditional 3/0 or 2/1, the student passes the exam.

If the vote is 1/2 or 0/3 and the exam is being conducted for the first time for that student, the student may retake the exam to continue the program. The committee will summarize its decision and detailed recommendations in a memo to the Program Director within two days of the exam. The committee's vote will not be recorded, unless the committee unanimously wishes to make its voting an open record. The same committee, in most cases, will administer the retaking of the exam

within 6 months. Retakes are encouraged to occur within 2 months if no academic requirements have been imposed by the committee (see Conditions below).

If the vote is 1/2 or 0/3 and the exam is a retake exam, the student fails.

3.3.6. Additional Details

Retakes: A student may retake the exam only once. At the time of the exam retake, the student must meet the GPA requirement and otherwise be in good academic standing.

Conditions: A vote of 'Pass' or 'Fail' can be accompanied by recommendations or requirements to be fulfilled by the student. These conditions will be based on the committee's interpretation of the student's exam performance relative to the Exam Philosophy criteria above. The conditions imposed by the committee should be directly relevant to the student's exam performance. Examiners are discouraged from using additional coursework as conditions. The Program Director will monitor the completion or non-completion of these conditions. If the student does not satisfactorily complete all of the Exam Committee requirements, the student cannot retake the qualifying exam or present an oral thesis proposal.

Notification: The administrative office will notify each student and the student's advisor in writing of the exam outcome and any additional requirements. The examination committee will not discuss the exam with the student until such notification has been made.

3.3.7. Appeal and Notification of Outcome

Appeals: The Qualifying Exam Committee determines whether the student passes or fails the exam. In the case of a second exam failure, the student's case is automatically considered by the Applied Physiology Program faculty at its next scheduled meeting following the student's qualifying exam. At this meeting each student will be discussed, and this discussion will be moderated by the Program Director. The Director will solicit comments from the student's research advisor, Qualifying Exam Committee, and the faculty as a whole. Any program faculty member may offer comments or ask questions. A vote is taken by secret ballot and tallied by the Program Director or his designate. A positive vote of greater than or equal to 2/3 of faculty in attendance is required for a student to remain in the program as a Ph.D. student. This vote is subject to Applied Physiology Program quorum requirements.

A faculty meeting shall be scheduled as soon as possible following a regularly scheduled qualifying exam period. There is only one opportunity for appeal.

3.4. ORAL PROPOSAL PRESENTATION

Within 6 months following successful completion of the qualifying exam, the student will make a public oral presentation of the dissertation proposal. The student should prepare a pre-proposal draft in consultation with their advisor for early review by their committee. The final proposal must reflect novel, independent work. The proposal should be written following the NIH guidelines for an F31 predoctoral fellowship.

The final format of the oral presentation will be determined by the Doctoral Advisory Committee but chaired by the Faculty Advisor. A typical format would begin with a brief (20-30 min) presentation of the proposed research to a public audience followed by an open discussion. The presentation should give both an overview of the problem to be addressed by the student's research and strategies for approaching the problem. The discussion that follows is often motivated by the proposal itself, but the committee may query any relevant area of applied physiology and related fields. The total time involved should not exceed three hours.

This presentation is technically intended for the doctoral advisory committee; however, other faculty and interested students are encouraged to assist the student in recognizing possible difficulties in his/her research plan prior to conducting the research. The Advisor shall determine when the "open forum" is closed to the public so that the Committee may then confer privately before any final questions are posed to the student.

A copy of the final proposal should be submitted to each committee member 3 weeks before and to the AP Academic Program Coordinator two weeks before the scheduled proposal presentation. At the same time, an electronic copy of the abstract should also be submitted to the AP Academic Program Coordinator for distribution to the entire faculty.

After the oral presentation, the committee will approve or disapprove the dissertation proposal. If approved, the student will submit the appropriate form to the Office of Graduate Studies to be formally admitted to Ph.D. candidacy. The student will proceed with the proposed research under the guidance and supervision of their advisory committee. If the proposal is disapproved, the student may make a second presentation within three months.

3.5. TEACHING REQUIREMENT

Doctoral students shall participate in at least one teaching practicum (one semester) to expose them to the elements involved in organizing and teaching a class. The purpose of the teaching practicum is to provide direct hands-on experience in teaching a university course. It is not merely being a TA (in fact, just grading papers will not count). Nor, on the other hand, should it involve total responsibility for teaching an entire course. It is a partnership between the doctoral student and a course instructor who serves as a teaching mentor.

Students will be required to work closely with this faculty member for one semester in all aspects of teaching a course, including planning the course, preparing and delivering lectures or leading discussion sessions, holding office hours, preparing and grading homework and exam questions. The faculty member will attend lectures delivered by the student and provide in-depth feedback.

The faculty member of record will maintain full responsibility for the course and is expected to provide the majority of class contact hours. The student should submit a formal request approved by the faculty member of record and the student's advisor to the AP Graduate Committee prior to the start of the term. As a rule, students would be expected to develop at least three 60 minute lectures but no more than five in any one semester.

To fulfill the teaching practicum, students shall complete the Center for Teaching and Learning (CETL) orientation for GTAs and at least one CETL course (e.g., CETL 8000) for 1 credit hour, either before or during the term they are involved with classroom teaching. As a part of the course, students will meet weekly during the semester with selected faculty members to discuss aspects of teaching (e.g. learning theories, teaching methods, assessment, and administrative tips). Ideally, the student will enroll in CETL 8000-BIO during their first semester in the program and obtain teaching experiences in a large lecture class setting that semester as well as subsequent experiences in a smaller, elective class related to their focus area of study.

3.6. DISSERTATION DEFENSE

The ability to conduct high quality independent research and achieve competence in scholarly exposition must be demonstrated by the preparation of a dissertation on a topic within one of the School's program areas. The dissertation must conform to Georgia Tech style and format (<http://www.grad.gatech.edu/theses-dissertations>), but may represent a compendium of chapters intended for independent publication. If any portions of the thesis have been previously published, it is the responsibility of the student to obtain permission from the copyright holder and any co-authors for inclusion of that work in the dissertation. After approval of the dissertation by the faculty advisor, it will be distributed to other members of the Doctoral Advisory Committee in preparation for the final oral defense. The dissertation must be in final form with respect to content, format, and accuracy. One copy should be submitted to each committee member and the AP Academic Program Coordinator two weeks prior to the date of the final oral defense. At the scheduled time, the Ph.D. candidate will make a public presentation of the dissertation to his/her committee and other interested students and faculty. Once the dissertation has been successfully defended, the candidate will then follow standard Georgia Tech procedures, as set by Graduate Studies, to formally be awarded the Ph.D. degree in Applied Physiology.

3.7. TIME TO DEGREE

Time to complete the Ph.D. in Applied Physiology is variable depending upon both the progress of the student and the nature of the dissertation research. The oral qualifying exam is typically taken during the second semester of the second year. The dissertation proposal should be presented within 6 to 12 months after completion of the qualifying exam. An additional two to three years is usually required to complete the dissertation. As per Georgia Tech policy, students must complete all degree requirements within 7 years from the end of the term in which they pass the oral qualifying exam.

4. FINANCIAL AID

The majority of financial assistance for graduate students at Georgia Tech comes from Graduate Assistantships. These assistantships support over 60% of GIT's full-time graduate students. They provide not only a modest stipend, but also lower tuition. Students on fellowships and assistantships must be enrolled full-time (12 credit hour minimum).

4.1. GRADUATE RESEARCH ASSISTANTSHIPS

Graduate Research Assistantships are funded by faculty research grants. Students on Graduate Research Assistantships typically participate in the faculty member's research, by running experiments, analyzing data, doing library research, writing computer programs, and co-authoring papers.

4.2. GRADUATE TEACHING ASSISTANTSHIPS

Graduate Teaching Assistantships are funded by the School in support of its academic mission. GTAs help faculty by grading, running labs, holding tutorials, etc. They are expected to develop instructional skills by attending assigned courses (e.g. CETL 8000) and ultimately prepare and develop a lecture in a specific course as determined by the Graduate Coordinator and faculty. GTA funding is renewable annually and not guaranteed throughout the program of study. A GTA should not be employed full-time in any other capacity (either on or off campus).

4.3. FELLOWSHIPS

Georgia Tech students hold a variety of national and local fellowships. Some are determined by national competitions (applications are usually due in early fall). Some fellowships are awarded by the academic departments at Georgia Tech. A few are administered by Graduate Studies, upon recommendation by a graduate coordinator. A Ph.D. student in Applied Physiology is expected to seek funding by applying for grants and fellowships. A list is available at <http://www.grad.gatech.edu/fellowships> and the database at https://pivot.cos.com/funding_main includes a number of predoctoral fellowships.

Trained professional and peer tutors are available to help graduate students with a wide variety of projects and documents, including fellowship applications. Additional information is available online: <http://www.communicationcenter.gatech.edu/>

4.4. LOANS

U.S. citizens and permanent residents are often eligible for special student loans. There are two federal direct loan programs for graduate students: the unsubsidized Direct Student Loan and the Graduate Plus Loan. (The [Office of Scholarships and Financial Aid](#) can assist international students with finding private loans.) To apply for a loan, students need to submit the Georgia Tech Application for Scholarships and Financial Aid and the FAFSA. For more information, click <http://www.finaid.gatech.edu/node/280>.

4.5. GEORGIA RESIDENCY

Because Georgia Tech is a state school, out-of-state residents must pay higher tuition. To be declared a Georgia resident for fee-payment purposes, you must show that you have lived here for more than one year and that you came to Georgia with the intent of establishing a domicile here, i.e. for reasons other than attending school. For a complete description of residency issues, please see the Registrar's page.

<http://www.registrar.gatech.edu/tuitionclassification/index.php>

5. COMMITTEES

The following committees govern the operation of Applied Physiology:

5.1. APPLIED PHYSIOLOGY GRADUATE COMMITTEE

The AP Graduate Committee (AP-GC) oversees academic issues associated with the School. The committee has responsibility for all graduate-level degree requirements, oversight of the Ph.D. Oral Qualifying Examinations, and approval of Ph.D. Thesis Reading Committees. A student may petition the AP-GC regarding academic issues by submitting a petition detailing his/her request to the Program Director. Committee membership is determined by appointment by the Director. Student questions related to academic matters should be directed to the AP-GC, faculty advisor, or Academic Program Coordinator.

5.2. FACULTY ADVISORY COMMITTEE

The Faculty Advisory Committee (FAC) consists of faculty members who act as an advisory body to the Program Director on all matters concerning the welfare of the Program. Additional responsibilities of the Faculty Advisory Committee include review of program delivery and requirements. The FAC meets regularly during the academic year. A doctoral student representative may be included as a part of this committee.

5.3. DOCTORAL ADVISORY COMMITTEE

Each student shall assemble a Doctoral Advisory Committee (DAC) to be chaired by the student's academic advisor. This committee must have at least **five** members, one of whom must be the student's advisor, and at least one of whom must be from the academic faculty outside of the Applied Physiology program. Note that the composition of this committee could change as the student moves through the program. Annual progress meetings should be scheduled by the student's faculty advisor with the DAC.

This committee must be approved by the AP-GC and serves as both the Thesis Advisory Committee and the Final Doctoral Examination Committee. Committee members must sign the Admission to Candidacy and Certificate of Thesis Approval forms. A checklist and all appropriate forms can be found at <http://www.grad.gatech.edu/theses-dissertations>

5.4. INSTITUTE GRADUATE COMMITTEE

This is a committee of the Georgia Tech Academic Faculty. The Institute Graduate Committee has responsibility for all Institute-wide academic policies and degree requirements at the graduate-level. In addition, the Institute Graduate Committee makes decisions regarding all Institute-level graduate student petitions. These petitions include, but are not limited to, late withdrawals, changes in graduate standing, grade disputes, and re-admissions. Student Petition forms are available in Records Office, located on the main floor of the Administration Building (Tech Tower). Students filing such petitions must discuss the petition with the School Chair. Additional information about filing petitions to the Institute Graduate Committee can be found at <http://grad.gatech.edu/petition-to-faculty>

6. GENERAL INFORMATION AND POLICIES

6.1. E-MAIL ACCOUNTS

The official method of Institute and AP communication to all faculty, staff, and students is by e-mail to the e-mail address of record. E-mail accounts will be assigned and maintained by OIT.

The faculty and staff e-mail address of record for AP, the Georgia Tech Office of Information Technology, and Georgia Tech Human Resources is the e-mail computer account administered by OIT. The format of the e-mail address is firstname.lastname@biosci.gatech.edu. This address shall serve as the official e-mail address on all written and electronic communications, from e-mail to business cards.

To ensure that Georgia Tech faculty, staff, and students do not inadvertently release intellectual property rights without written permission, only Georgia Tech e-mail services should be used to conduct Georgia Tech business. Many outside companies and organizations that host e-mail services claim intellectual property rights on all content of e-mail sent to/from their servers. Hence, faculty, staff, and students should not use accounts on Hotmail, Yahoo, or other non-approved services for Georgia Tech business.

6.2. COPYRIGHT ISSUES

AP recognizes the copyrights of individual software providers. AP recognizes the copyrights of web pages and the information contained within those sources. AP does not allow copying of material created by others onto the School's web servers without written permission from the copyright owner.

6.3. CHEMICAL SAFETY

All students will complete the online basic Right-to-Know training program from the office of Environmental Health & Safety (<http://www.usg.edu/facilities/rtk-ghs>). This program is designed to educate USG employees on the importance and benefits of properly recognizing and safely working with hazardous materials.

6.4. HUMAN SUBJECTS

Georgia Tech is committed to protecting the rights and welfare of human subjects of research conducted on the campus or sponsored by the Institute, regardless of source of funding. Georgia Tech subscribes to the basic ethical principles that should underlie the conduct of biomedical, social, and behavioral research involving human subjects as set forth in the "Belmont Report."

The Institutional Review Board (IRB) is charged with ensuring that the rights and welfare of human subjects are protected by reviewing projects and activities at Georgia Tech that involve human subjects. The IRB has the responsibility and authority to review, approve, disapprove, or require changes in research activities involving human subjects. All research activities involving human subjects must be reviewed by Georgia Tech's Institutional Review Board. This policy **applies to all faculty, staff, and student projects, regardless of whether the project is funded externally, internally, or**

receives no funding support. Any student (graduate or undergraduate) who works with data from human subjects must be certified and listed on the IRB application. This resource will assist in preparing an IRB application and complete the mandatory on-line training. <http://www.compliance.gatech.edu/citi-training>. Because human subjects research plays a fundamental role in physiological research, all Applied Physiology doctoral students are required to complete the modules "History and Ethics," and "Defining Research and Regulatory Overview". (<http://researchintegrity.gatech.edu/about-irb/irb-required-training>) to provide a basic understanding of the issues involved.

6.5. ANIMAL RESEARCH

For both humanitarian and scientific reasons, Georgia Tech is committed to ensuring that animals involved in research and teaching receive humane care and treatment. The animal facilities at Georgia Tech are registered with the U.S. Department of Agriculture (USDA) as required by the Federal Animal Welfare Act. This Act provides guidelines for the care and use of laboratory animals, their proper disposition, and record keeping. Internally, Georgia Tech's Institutional Animal Care and Use Committee (IACUC), mandated by law as an independent committee, regularly inspects and monitors the total animal care and use program at the Institute to ensure that all components are in compliance with regulations and guidelines. The IACUC is concerned with the procurement, housing, humane care, use, and disposition of animals involved in both teaching and research activities at Georgia Tech. All research activities involving animal subjects must be reviewed by the Georgia Tech Institutional Animal Care and Use Committee (IACUC), regardless of whether the research is conducted on campus or off campus. The IACUC meets monthly to review research proposals/protocols which include research using animal subjects. <http://www.compliance.gatech.edu/IACUC/>

The IACUC requires that all faculty, staff, and students working with animals complete http://researchintegrity.gatech.edu/sites/default/files/documents/taking_the_iacuc_animal_research_refresher_course.pdf from the Collaborative Institutional Training Initiative (CITI). Every person listed on a protocol must complete at least the "Working with the IACUC, Investigators, Staff and Students" module. Because animal research plays a fundamental role in physiological research, all Applied Physiology doctoral students are required to complete this module to provide a basic understanding of the issues involved. Students working with animals are required to enroll in the Occupational Health Program <http://researchintegrity.gatech.edu/about-iacuc/occupational-health-program>

6.6. RESPONSIBLE CONDUCT OF RESEARCH

Responsible Conduct of Research (RCR) is defined as the practice of scientific investigation with integrity. It involves the awareness and application of established professional norms and ethical principles in the performance of all activities related to scientific research. It is the policy of Georgia Institute of Technology that all students who participate in Georgia Tech's Undergraduate Research Program and any student receiving research funds or who participates in research activities funded by NIH or NSF, must engage in a program of study in the Responsible Conduct of Research. This consists of written training and in-person training.

Students should visit www.citiprogram.org to register for a user name and password. Students should complete the required modules:

- 1.) Misconduct – Plagiarism;
- 2.) Data – Who Owns Research Data;
- 3.) Authorship – Sherry’s Secret;
- 4.) Peer Review – What is Responsible Peer Review;
- 5.) Mentoring – Business of Mentoring;
- 6.) Conflict of Interest (COI) – Promising New Technology;
- 7.) Collaborative Research – Scenarios & Resolutions.

Once the required modules have been completed, the grade book should be checked to ensure that all modules have been completed. Students should complete the confirmation form and submit. The Georgia Tech Office of Sponsored Programs will receive from CITI electronic notification of completion; however, users should print and keep the completion report just in case verification is needed. See CITI training information for complete instructions.

Students must participate in a class, seminar, or other interactive program that addresses ethical issues relevant to the discipline as well as broader issues of research integrity, such as the Research Ethics Course (PST 8000, PHIL 6000) offered by the Ivan Allen College, or the Research Ethics Webinar offered two times per semester by OSP’s e-Commerce Office.

See <http://rcr.gatech.edu/online-training> for additional information.

It is expected that all Applied Physiology PhD students must complete the CITI program and an in-person class or seminar to complete the Responsible Conduct of Research requirement.

6.7. HONOR CODE

Honesty is expected of all students in the Ph.D. program. The Georgia Tech Honor Code is intended to continuously remind students of the importance of honesty in their academic and professional lives. It also serves to create awareness on the part of both students and faculty of the rules regarding academic honesty and the processes to be followed when those rules are broken. In addition to the Honor Code and Honor Pledge students should be aware of the Rules for Student Conduct found in the Georgia Tech General Catalog. Of particular relevance are the rules that apply to academic misconduct. For additional information about the Honor Code and for a complete copy of the text go to the Georgia Tech On-Line Catalog at <http://www.policylibrary.gatech.edu/student-affairs/academic-honor-code>

Honor Pledge

All students are required, when requested, to attach the following statement to any material turned in for a grade in any course in the PhD program.

“On my honor, I pledge that I have neither given nor received inappropriate aid in the preparation of this assignment.”

Signature of Student _____

It is the responsibility of the faculty member teaching the course to make clear to the students at the beginning of the semester what is considered appropriate and what is not.

6.8. STUDENT HEALTH ISSUES

Student Injury

On Campus – Any injury or exposure to hazardous lab material sustained by the student **MUST BE REPORTED IMMEDIATELY** to the student's instructor or supervisor. Exposures include: a.) needle stick with a needle used on a specific person or patient; b.) needle stick with a needle from a trash or discarded container; c.) patient's body fluid (blood, sputum, urine, vomitus) splash to eyes, nose, mouth, or open cuts; d.) mouth to mouth resuscitation; and e.) human bites. In the event of injury or exposure, Student Health Services has established procedures which must be followed. For more information, visit the Georgia Tech Wellness Center website at www.health.gatech.edu.

Other Off-Campus Sites – Any injury or exposure to hazardous material sustained by the student **MUST BE REPORTED IMMEDIATELY** to the instructor and clinical supervisor for instructions. Each department or clinical site is responsible for identifying and following proper exposure procedure for their clinical affiliations.

If a student receives a minor injury during day time class hours, medical care may be obtained through the Georgia Tech Student Health Center. For serious injuries it is recommended that the student be seen in the nearest hospital emergency room. The student is responsible for class work missed due to injury or accident. The student is also responsible for any fees incurred for evaluation and treatment.

Health Immunization Screening/Post Exposure (fees are variable – check with the Student Health Center)

In accordance with the Centers for Disease Control and Prevention, students involved in human subject interaction are required to have the following immunizations and to provide documentation to the Georgia Tech Student Health Center:

- Hepatitis B
- Measles, Mumps, Rubella and Rubeola
- Tetanus
- Tuberculosis Screening

Contact Information for Georgia Tech Student Health Center

Phone: 404-894-1420

Location: 740 Ferst Drive, Atlanta, GA 30332, next to Campus Recreation Center (CRC)

Web: <http://health.gatech.edu/home>

Hours of Operation

Mon - Wed: 8:00a–5:00p

Thurs: 9:00a–5:00p

Fri: 8:00a–5:00p

Disability Services

Georgia Tech resources are available to ensure that individuals with disabilities have an equal opportunity to pursue education or employment and have access to campus programs, activities, or services. For more information, students may visit the Office of Disability Services website <http://disabilityservices.gatech.edu/>.

7. FACILITIES

7.1. BUILDING INFORMATION

This is a secure facility, and visitors need to make advance arrangements with their host. Research labs in Applied Physiology are concentrated in biomechanics, neural control, muscle and exercise physiology. Research tools, available at the discretion of individual faculty, include large and small scale motion capture, a variety of force measurements systems, fluororadiography, a split-belt force-measuring treadmill, a FES system, multi-channel wireless EMG system, a robotic system for use in the study of neural control of the upper extremity, human performance, metabolic analysis, biochemical purification and analysis, histology and cell culture. The Masters' program in Prosthetics and Orthotics is also located in the building. There are technical fabrication laboratories, materials testing instruments as well as patient care laboratories. The building also houses our administrative offices, classrooms and conference facilities.

Access to Facilities

In order to maintain the rights and **safety** of students in various aspects of the graduate program, the following policy has been adopted:

1. Student access to the specific labs must be requested, on their behalf, by the faculty PI. Requests are to be sent to Brent Minter, brent.minter@biosci.gatech.edu Facilities Electronics Operations Manager, School of Biological Sciences. Building access is only through a BuzzCard and that number must be registered to maintain access. Key distribution/return and/or lock replacement subject to School of Biological Sciences policy.
2. Laboratory should be locked at all times unless occupied by departmental students or personnel. During non-business hours (evenings/weekends) even occupied classrooms, labs, student offices, and corridor doors must be locked. The last person to leave any area is responsible for turning off all equipment,

and for locking doors. Building, corridor, or room doors should not be propped open during non-business hours under any conditions.

Policy on Student Use of School Copier

Students will be permitted to use the copy machine at 14th Street in order to make **one copy** of materials on file in the AP Academic Program Coordinator's office. This machine is not to be used for copying other non-departmental or other personal materials. If this privilege is abused, students will be expected to pay for charges each semester.

8. **APPENDIX A: SCHOOL FORMS**

**Program of Study
(Applied Physiology, Program-level)**

**Doctoral Advisory Committee Membership
(Applied Physiology, Program-level)**

**Teaching Practicum Contract
(Applied Physiology, Program-level)**

Go to: <http://www.grad.gatech.edu/theses-dissertations-forms>

for the following:

Request for Approval of a Doctoral Minor (Institute)

Request Admission to Candidacy (Institute)

Certificate of Thesis Approval (Institute)

Georgia Institute of Technology – School of Biological Sciences

PhD in Applied Physiology - Program of Study

Original _____
 Revised _____

DEADLINE: 1st semester

The proposed Program of Study must be submitted to the AP-Academic Program Coordinator within the first semester of enrollment in the PhD program. The completed, signed form must be submitted with a brief justification of course selection. This Program of Study is subject to review by the Faculty Advisor and the AP Graduate Committee (AP-GC) who will evaluate the proposed coursework with regard to depth, breadth, relevance to research objectives, and academic rigor of the proposed courses and requires approval of the Program Director.

Name: _____ Email: _____ GTID# _____

Include Course Number, Course Title, and Credit Hours for each proposed course.

Systems Physiology, Seminar, RCR (13 semester hours)			Minor Program (9 semester hr) some outside APPH		
Number	Course Title	Hours	Number	Course Title	Hours
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
APPH 8000	Seminar	3			
PHIL 6000	Responsible Cond Res	1 *or equivalent			

Focus Area (6 semester hours, maximum of 3 hours at 4000 level, no Spec. Problems, letter grade only)			Thesis (minimum of 12 semester hours)		
Number	Course Title	Hours	Number	Course Title	Hours
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Statistics (3 semester hours, at 6000-7000 level)

	Hours Required:	Hours Proposed:
Credit hours in Systems Physiology:	9	_____
Credit hours in Statistics:	3	_____
Credit hours in Seminar and PHIL 6000:	4	_____
Focus Area Courses:	6	_____
Minor Program (9 hrs. required)	9	_____
Thesis hours (minimum):	<u>12</u>	_____
Total Minimum Semester Hours for Degree: 6 hr maximum of 4000	42	_____

Tentative Thesis Topic: _____
 Projected Date of Graduation _____ Signed _____ Date _____

RECOMMENDED _____
Faculty Advisor (SIGNATURE REQUIRED) PRINT NAME Date

RECOMMENDED _____
AP Graduate Committee (SIGNATURE REQUIRED) PRINT NAME Date

RECOMMENDED _____
AP Graduate Committee (SIGNATURE REQUIRED) PRINT NAME Date

Approved _____ Not Approved _____

 Program Director Date

DOCTORAL ADVISORY COMMITTEE MEMBERSHIP
School of Biological Sciences

Date: _____ Initial membership form Revised membership form

Student: _____ Semester entered program: _____
First Middle Last

Advisory Committee members (*must have at least 5, with primary advisor within the Applied Physiology program, and at least one member from outside of Applied Physiology program*)

1) _____
Advisor Printed name Signature Date School or Department

2) _____
Member or Co-Advisor Printed name Signature Date School or Department

3) _____
External Member Printed name Signature Date School or Department

4) _____
Member Printed name Signature Date School or Department

5) _____
Member Printed name Signature Date School or Department

Member Printed name Signature Date School or Department

Member Printed name Signature Date School or Department

Submit the completed and signed initial form to the AP Academic Program Coordinator by the end of the second semester of your program. If subsequent revisions are made, you are responsible for submitting a new completed and signed revision form. Program Director will have final signature.

Program Director Printed name Signature Date School or Department

(Revised: 9/19/17)

Georgia Institute of Technology
Applied Physiology: TEACHING PRACTICUM CONTRACT

Original _____ Revised _____ FINAL _____ Date _____

The proposed Teaching Practicum plan should be submitted to the AP Academic Program Coordinator within the first year of enrollment in the Ph.D. Program. It is recommended to be completed by ~ 2nd full year of study but submitted (with signatures of course mentors) and approved before the doctoral student is admitted to candidacy. This contract is subject to approval by the Program Director and AP Graduate Committee, who will evaluate the proposed teaching requirement. Note: Three different lectures/laboratory classes (not the same lecture delivered three times) of at least 60 minute duration are required (not to exceed 5 within a semester).

Name _____ Email _____ GTID# _____

Include Course Number, Course Title, and Title of lecture (and time) for each proposed course and course mentor.

Course Title/number	Term	LECTURE (duration)	COURSE MENTOR	signature
1. _____	_____	_____	_____	_____
2. _____	_____	_____	_____	_____
3. _____	_____	_____	_____	_____
Additional instruction				
4. _____	_____	_____	_____	_____
5. _____	_____	_____	_____	_____

Projected Date of Graduation _____ Signed _____ Date _____

RECOMMENDED _____
Faculty Advisor (SIGNATURE REQUIRED) PRINT NAME Date

Approved _____ Not Approved _____
Program Director Date

COMMENTS:

(Revised: 9/19/17)

9. APPENDIX B: COURSES OFFERED TO PHD STUDENTS

School of Biological Sciences

<u>Course Number</u>	<u>Course Name</u>	<u>Credit Hours</u>	<u>Instructor</u>
APPH 4100	Exercise Physiology	3	Millard-Stafford
APPH 6202	Gait Analysis in Prosthetics and Orthotics	3	Chang
APPH 6203	Biomechanics/Kinesiology	2	Prilutsky
APPH 6209	Clinical Pathology	2	Fink
APPH 6211	Systems Physiology I	3	Jang
APPH 6212	Systems Physiology II	3	Balog
APPH 6213	Systems Physiology III	3	Millard-Stafford
APPH 6216	Rehabilitation Research	1	Nichols
APPH 6225	Biostatistics	3	Snow
APPH 6230	Exercise Metabolism	3	Millard-Stafford
APPH 6231	Biomechanical Aspects of Motor Control	3	Prilutsky
APPH 6232	Locomotion Neuromechanics	3	Chang
APPH 6236	Neuromuscular Physiology	3	Shinohara
APPH 6237	Human Neuroimaging	3	Wheaton
APPH 6238	Ion Channel Structure, Function & Regulation	3	Balog
APPH 8000	PhD Seminar	3	Nichols

Potential Course Electives Outside APPH

Biology

BIOL 4150 Genomics & Applied Bioinformatics
BIOL 4446 Animal Physiology
BIOL 4570 Immunology & Immunochemistry
BIOL 4668 Eukaryotic Molecular Genetics
BIOL 4752 Introduction to Neuroscience
BIOL 6570 Immunology
BIOL 6756 Discovery of Signaling Molecules
BIOL 7668 Eukaryotic Molecular Genetics
BIOL 7963 Advances in Molecular Biology
BIOL 7001 Foundations in Molecular & Cell Biology
BIOL 8006 Integrative Approaches to Biological Systems

Biomedical Engineering

BMED 4758 Biosolid Mechanics
BMED 4764 Engineering Electrophysiology
BMED 6210 Medical Resonance Imaging
BMED 6743 Tissue Mechanics
BMED 6774 Biomaterials
BMED 6777 Advanced Biomaterials
BMED 6780 Medical Image Processing
BMED 6782 Cellular Engineering
BMED 6787 Quantitative Electrophysiology
BMED 6793 Systems Pathophysiology
BMED 6794 Tissue Engineering

CHBE and Chemistry

CHBE 6281 Mass Spectrometry
CHEM 4511 Biochemistry I
CHEM 4512 Biochemistry II
CHEM 4521 Biophysical Chemistry
CHEM 6501 Biochemistry I
CHEM 6502 Biochemistry II
CHEM 6571 Enzymology & Metabolism
CHEM 6572 Macromolecular Structure
CHEM 6573 Molecular Biochemistry
CHEM 6582 Biophysical Chemistry

ECE/Math/Mechanical Engineering

ECE 6550 Linear Systems & Controls
MATH 6705 Modeling & Dynamics
ME 6201 Continuum Mechanics
ME 6441 Dynamics of Mechanical Sys.
ME 6770 Energy: Elasticity & Plasticity

Psychology

PSYC 6013 Biopsychology
PSYC 6020 Statistical Analysis II