GRADUATE EDUCATION

DEPARTMENT OF INTEGRATIVE PHYSIOLOGY

UNIVERSITY OF NORTH TEXAS HEALTH SCIENCE CENTER AT FORT WORTH

POLICIES AND GUIDELINES

Revised August, 2005

Course Numbers Edited August, 2009

GRADUATE PROGRAMS IN THE DEPARTMENT OF INTEGRATIVE PHYSIOLOGY

I. GENERAL DESCRIPTION:

A student interested in graduate work in physiology may pursue either the M.S. or Ph.D. degree in Biomedical Sciences (Integrative Physiology) within the Graduate School of Biomedical Sciences of the University of North Texas Health Science Center at Fort Worth (UNTHSC). In addition, dual degree programs of DO/MS or DO/PhD can be achieved. For a complete general description of the program and degree requirements of these departments, the prospective student should consult the graduate catalog of UNTHSC. The requirements outlined in the present document fulfill the requirements delineated in the graduate catalog and are intended to provide the student with the specific programs available in the Department of Integrative Physiology.

II. ENTRANCE REQUIREMENTS:

Requirements for admission into departmental M.S. and Ph.D. degree programs are as stated in the current catalog for admission to the Graduate School of Biomedical Sciences at UNTHSC.

III. DEGREE REQUIREMENTS:

A. Credit Hours (Graduate Level Courses) Required for Degree Programs

1. An M.S. in Biomedical Sciences requires a minimum of 30 credit hours. Departmental requirements extend this to 31 credit hours. There are three concepts of the M.S. degree education. These are:
   a. students who wish to obtain only an M.S.;
   b. a Ph.D. student who fails to achieve a Ph.D. and is awarded a terminal M.S. degree;
   c. those who explore the M.S. degree as a means of going on further to a Ph.D.

2. A Ph.D. in Biomedical Sciences requires a minimum of 90 credit hours. Typical departmental degree plans require 96 credit hours.

3. Core Curriculum Requirements for All Students
   M.S. and Ph.D. students must complete the BMSC core requirements as described in the graduate school catalog. For those students entering the Ph.D. degree program with an M.S. degree, the core program will be determined by the student's Ph.D. degree committee and the Dean of the Graduate School. In some instances, students may be required to take additional courses or request to waive a core requirement depending on their backgrounds. This will be determined by the student's committee and approved by the Graduate Dean.

4. M.S. and Ph.D. Degree Plans
   For the doctoral program, two tracks are available. The Integrative Cardiovascular Science Track provides integrative training and the Molecular Cardiovascular Science Track provides additional training in molecular biology.

M.S. Degree Plan for Integrative Physiology

Year 1: Fall

BMSC 6301 Integrative Biomedical Sciences I: Principles of Biochemistry	4 SCH
BMSC 6302 Integrative Biomedical Sciences II: Molecular Cell Biology	4 SCH
BMSC 5135 Introduction to Faculty Research Programs	1 SCH
BMSC 5160 Biomedical Ethics	1 SCH
PSIO 5140 Seminar in Current Topics	1 SCH
Electives	1 SCH
Total	**12 SCH**

Year 1: Spring

BMSC 6303 Integrative Biomedical Sciences III: Physiology	3 SCH
BMSC 6304 Integrative Biomedical Sciences IV: Pharmacology	2 SCH
BMSC 6305 Integrative Biomedical Sciences V: Immunology and Microbiology*	3 SCH
BMSC 5135 Introduction to Faculty Research Programs	1 SCH
BMSC 5310 Scientific Communications	3 SCH
Total	**12 SCH**

Year 1: Summer

BMSC 5400 Biostatistics for BMSC	4 SCH
BMSC 5395 Thesis	3 SCH
Total	**7 SCH**

TOTAL	**31 SCH**

* With consent of advisory committee, an elective may be substituted for BMSC 6305.

In some cases, a different degree plan may be applicable. In all cases the degree plan must be approved by the student's advisory committee and by the dean of the graduate school.

Ph.D. Degree Plan for Integrative Physiology, Integrative Cardiovascular Science Track

Year 1: Fall	
BMSC 6301 Integrative Biomedical Sciences I: Principles of Biochemistry	4 SCH
BMSC 6302 Integrative Biomedical Sciences II: Molecular Cell Biology	4 SCH
BMSC 5960 Biomedical Ethics	1 SCH
PSIO 5140 Seminar in Current Topics	1 SCH
BMSC 5940 Introduction to Faculty Research	1 SCH
Electives*	1 SCH
Total	**12 SCH**
Year 1: Spring	
BMSC 6303 Integrative Biomedical Sciences III: Physiology	3 SCH
BMSC 6304 Integrative Biomedical Sciences IV: Pharmacology	2 SCH
BMSC 6305 Integrative Biomedical Sciences V: Immunology and Microbiology*	3 SCH
BMSC 5940 Introduction to Faculty Research	1 SCH
PSIO 5140 Seminar in Current Topics	1 SCH
Electives*	2 SCH
Total	**12 SCH**
Year 1: Summer	
BMSC 5400 Biostatistics for Biomedical Sciences	4 SCH
Electives*	2 SCH
Total	**6 SCH**
Year 2: Fall	
PSIO 5300 Cardiovascular Physiology 1	3 SCH
PSIO 5140 Seminar in Current Topics	1 SCH
BMSC 5310 Scientific Communications	3 SCH
Electives*	5 SCH
Total	**12 SCH**
Year 2: Spring	
PSIO 5301 Cardiovascular Physiology 2	3 SCH
Electives*	9 SCH
Total	**12 SCH**
Year 2: Summer	
Electives*	**6 SCH**

Year 3: Fall**

Electives*	**12 SCH**

Year 3: Spring

BMSC 6310 Grant Writing	3 SCH
Electives*	9 SCH
Total	**12 SCH**

Year 3: Summer

BMSC 6395 Doctoral Dissertation	**6 SCH**

Year 3: Fall

BMSC 6395 Doctoral Dissertation	**6 SCH**

Total	**96 SCH**

* With consent of advisory committee, an elective may be substituted for BMSC 6305. Electives must include at least 3 SCH of BMSC 6998 Individual Research and at least 3 of the following courses

PSIO 5302	Respiratory Physiology
PSIO 5303	Renal Physiology
PSIO 5304	Molecular Genetics of Cardiac and Vascular Disease
PSIO 6350	Physiology of Skeletal and Smooth Muscle
PSIO 6360	Cardiovascular Regulation During Exercise
PSIO 6370	Advanced Endocrine Physiology
PSIO 6380	Advanced Autonomic Nervous System Physiology
PSIO 6390	Myocardial Metabolism: Concepts and Controversies

**The Admission To Candidacy Examination shall be taken during this semester.

In some cases, a different degree plan may be applicable. In all cases the degree plan must be approved by the student's advisory committee and by the dean of the graduate school.

Ph.D. Degree Plan for Integrative Physiology, Molecular Cardiovascular Science Track

Year 1: Fall	
BMSC 6301 Integrative Biomedical Sciences I: Principles of Biochemistry	4 SCH
BMSC 6302 Integrative Biomedical Sciences II: Molecular Cell Biology	4 SCH
BMSC 5960 Biomedical Ethics	1 SCH
PSIO 5140 Seminar in Current Topics	1 SCH
BMSC 5140 Introduction to Faculty Research	1 SCH
Electives*	1 SCH
Total	**12 SCH**
Year 1: Spring	
BMSC 6303 Integrative Biomedical Sciences III: Physiology	3 SCH
BMSC 6304 Integrative Biomedical Sciences IV: Pharmacology	2 SCH
BMSC 6305 Integrative Biomedical Sciences V: Immunology and Microbiology*	3 SCH
BMSC 5940 Introduction to Faculty Research	1 SCH
PSIO 5140 Seminar in Current Topics	1 SCH
Electives*	2 SCH
Total	**12 SCH**
Year 1: Summer	
CBAN 6440 Methods in Molecular Biology	4 SCH
Electives*	2 SCH
Total	**6 SCH**
Year 2: Fall	
PSIO 5300 Cardiovascular Physiology 1	3 SCH
PSIO 5140 Seminar in Current Topics	1 SCH
BMSC 5310 Scientific Communications	3 SCH
Electives*	5 SCH
Total	**12 SCH**
Year 2: Spring	
PSIO 5304 Molecular Genetics of Cardiovascular Disease	3 SCH
Electives*	9 SCH
Total	**12 SCH**
Year 2: Summer	
BMSC 5400 Biostatistics for Biomedical Sciences	**6 SCH**

Year 3: Fall**

Electives*	**12 SCH**

Year 3: Spring

BMSC 6310 Grant Writing	3 SCH
Electives*	9 SCH
Total	**12 SCH**

Year 3: Summer

BMSC 6395 Doctoral Dissertation	**6 SCH**

Year 3: Fall

BMSC 6395 Doctoral Dissertation	**6 SCH**

Total	**96 SCH**

* With consent of advisory committee, an elective may be substituted for BMSC 6305. Electives must include 3 SCH of BMSC 6998 Individual Research, and at least 2 of the following courses:

MOLB 6435 Molecular Aspects of Cell Signaling
PSIO 6310 Functional Genomics and Proteomics
PSIO 6390 Myocardial Metabolism: Concepts and Controversies
PHRM 6320 Advances in Molecular Pharmacology

and at least 2 of the following courses:

PSIO 5301 Cardiovascular Physiology
PSIO 5302 Respiratory Physiology
PSIO 5303 Renal Physiology
PSIO 5304 Molecular Genetics of Cardiac and Vascular Disease
PSIO 6350 Physiology of Skeletal and Smooth Muscle
PSIO 6360 Cardiovascular Regulation During Exercise
PSIO 6370 Advanced Endocrine Physiology
PSIO 6380 Advanced Autonomic Nervous System Physiology
PSIO 6390 Myocardial Metabolism: Concepts and Controversies

**The Admission To Candidacy Examination shall be taken during this semester.

In some cases, a different degree plan may be applicable. In all cases the degree plan must be approved by the student's advisory committee and by the dean of the graduate school.

At least 3 SCH of PSIO 5140 shall be taken by doctoral students, but no more than 1 SCH may be awarded per semester. Students are required to present at least one seminar in PSIO 5140. For semesters in which one credit is earned without a seminar presentation, students are required to attend seminars and participate in a Journal Club. Students are required to maintain a Seminar Journal. The format and minimum requirements for the journal will be determined by the seminar course director. The journal will be submitted to the course director for review/grading at the conclusion of each semester.

For students entering the Ph.D. program with the M.S. or other advanced degree, certain of the BMSC core courses may be waived. Waiving of a core course will usually require that the student has made a grade of B or above in an equivalent course or has made a grade of 80 or above in a waiver examination. The waiving of a course does not mean the student will receive credit for those specific course hours toward the Ph.D. degree. Once it is determined which core courses are to be waived, the remaining course hours required for the Ph.D. are determined by the student's Advisory Committee.

5. D.O./M.S. Degrees At least 18 SCH, not including courses in the D.O. program will be required to obtain the M.S. degree. These SCH will normally include:

BMSC 5400	Biostatistics for Biomedical Sciences	4 SCH
PSIO 5300	Cardiovascular Physiology 1	3 SCH
PSIO 5301	Cardiovascular Physiology 2	3 SCH
BMSC 5395	Thesis	3-6 SCH
Electives	Variable	

6. D.O./Ph.D. Degrees At least 45 SCH, not including courses in the D.O. program, are required to obtain the Ph.D. degree as a second terminal degree. These SCH will normally include:

BMSC 5400	Biostatistics for Biomedical Sciences	4 SCH
PSIO 5300	Cardiovascular Physiology I	3 SCH
PSIO 5301	Cardiovascular Physiology II	3 SCH
BMSC 6998	Individual Research	3 or more SCH
BMSC 6395	Doctoral Dissertation	12 SCH
PSIO 6385	Current Topics in Physiology	3 SCH
Electives		Variable

7. The Ph.D. in Physiology as a second terminal degree For students entering the program with an earned terminal degree (D.O., M.D., Ph.D., etc.), the program requirements are as listed above for the D.O./Ph.D degree.

B. Grades

To be in good standing, M.S. and Ph.D. students must maintain an overall grade point average of 3.0 or above. If the grade point average falls below 3.0, this situation must be remedied in accordance with GSBS policies.

M.S. and Ph.D. students must earn a grade of B or A in BMSC 6303. Ph.D. students must achieve an overall grade point average of 3.0 in BMSC core courses: BMSC 6301, BMSC 6302, BMSC 6303, BMSC 6304, and BMSC 6305 (if taken). If a M.S. or Ph.D. student receives more than one C grade in these BMSC core courses, this situation must be remedied by retaking course(s), since credit for only one C grade will be allowed for BMSC 6301, BMSC 6302, and BMSC 6304.

If a M.S. or Ph.D. student does not earn a grade of B or A in any core or elective course, the student's advisory committee may require the student to retake the course and earn a grade of B or A.

C. Research

The M.S. thesis and the Ph.D. dissertation will require meaningful research of publishable quality. Advancement to Ph.D. candidacy will require the student to develop, write, and defend before the student's advisory committee an NIH-type research grant proposal. In addition, the student must successfully defend his or her knowledge of physiology in an oral defense before a departmental examination committee. Furthermore, it will be expected that as early as possible, the Ph.D. candidate present a seminar on his or her research in progress. Furthermore, it will normally be required that the Ph.D. candidate be first-author on a minimum of two meaningful research papers (either submitted, in press, or published) prior to being awarded the terminal degree. This requirement applies to all students in a Ph.D. program, whether they enter with an M.S. or another terminal degree. A student who, in the judgment of the advisory committee, was not the primary author of the submitted papers on his or her research will be required to write a traditional dissertation. The advisory committee may require that M.S. thesis research be submitted for publication before the degree is awarded.

D. Course Load and Time Commitment

Since research is a major part of the degree requirement for the M.S. and Ph.D. degrees, it will normally be expected that all full time students spend at least 40 hours per week at UNTHSC. When not in class or attending departmental seminar or journal club, the student will report to the laboratory of their mentor. First year students who have not selected a mentor will be assigned to laboratory rotations by the departmental graduate advisor, and these students must report to the assigned laboratory when not in class. These time commitments are required of students receiving financial support from UNTHSC. Absence from the assigned laboratory must be approved by the mentor or laboratory director.

All M.S. and Ph.D. students are required to attend departmental seminars and journal club, whether or not they are registered for seminar credit. Absence from departmental seminars and journal club meetings must be approved by the departmental seminar director prior to the seminar or journal club meeting if at all possible.

E. Examinations

In addition to the examinations given as a part of a course, the student pursuing either the M.S. or Ph.D. degree must satisfactorily pass certain department or university required examinations as follows:

1. M.S. Degree. Following the first year of formal coursework, the student must satisfactorily demonstrate his or her understanding of integrative physiology in an oral Progress Examination. A passing grade will permit registration for Year 2 coursework. This test will be given by a committee of the faculty of the Department of Integrative Physiology, which will not include the student's mentor. In addition, before the awarding of the M.S. degree, the student must satisfactorily defend his or her thesis.

2. Ph.D. Degree. Following the first year, the student must perform satisfactorily on an oral Progress Examination in integrative physiology as outlined above. Students entering the program with a terminal degree (for example: D.O., M.D., D.V.M., etc.) will normally take this examination during the Fall of the first year at UNTHSC. If the degreed student does not show proficiency in Physiology, he/she will be required to make a grade of "B" or better in BMSC 6303. Credit for this course will not count toward the Ph.D. degree plan.

   Prior to completing 72 SCH, each Ph.D. student must take an oral Admission to Candidacy Examination covering integrative physiology and research aptitude before the departmental examining committee, which will not include the mentor of the student. This examination must be passed before the student may register for BMSC 6010. Successful completion of BMSC 6010 is required for Admission to Candidacy. BMSC 6310 requires all Ph.D. students to satisfactorily develop, write, publicly present, and defend before the student's Ph.D. committee, an NIH style grant application. This grant proposal may describe the student's proposed dissertation research, and if so serve as the dissertation proposal. This course must be taken in the first long semester after passing the Admission to Candidacy Examination and before 84 SCH are earned.

F. Teaching Assistance

As part of their training, all students pursuing the M.S. or Ph.D. degree may be required to assist in the physiology teaching mission. This policy applies whether or not the student receives financial support from the Department of Integrative Physiology.

IV. DEPARTMENTAL FINANCIAL SUPPORT

Qualified students pursuing either the M.S. or Ph.D. degree may receive financial support. These funds may be provided by graduate student stipends available to the department, departmental resources, research grants, or an NIH predoctoral training grant. Recipients must meet the requirements of the relevant source. The level of support, regardless of the source, is compatible with the current level of NIH predoctoral stipends and is set by the Graduate School. Furthermore, regardless of the source of support during the first year, efforts will be made following the first year of study to support the student from grant funds garnered by the student's research supervisor.

V. ADVISING

Graduate students will select a major advisor, and in consultation with the advisor, select an advisory committee before completing two semesters in the program. Prior to selecting a major advisor, graduate students will be advised by the departmental graduate student advisor.

Graduate students working off-campus on a thesis or dissertation project may have an off-site research advisor who may be appointed as an adjunct faculty member of the department and who must be appointed as an adjunct or temporary member of the Graduate School faculty. The student's thesis or dissertation defense must be presented on campus.

The advisory committee and the student will be expected to meet at least once each academic year to review the student's progress and direction.