DOCTOR OF PHILOSOPHY
(Ph.D.)

*IMPORTANT Note About the Doctor of Philosophy in Physiology Degree*
This program is no longer accepting students at this time as this field of study is now a discipline within the new Integrated Biomedical Sciences (IBMS) Program. All information in this section of the Catalog is for the current Physiology students only.

Physiology is the study of the structure, and function, and integration of the human body. In the pioneering days, research efforts were primarily directed at tissues and organs. This research continues to this day and has resulted in a comprehensive picture of the function of the human body. As molecular and genetic methods have come of age, physiologists have implemented these techniques to elucidate the molecular mechanisms that underlie physiological function. It is now clear that in order to develop a complete understanding of the normal and dysfunctional human body, we must ask questions at all levels, from the molecular to the cellular, to the organ, to the whole organism.

Graduate studies leading to a Doctor of Philosophy degree in the basic biomedical sciences are offered.

Physiology Degree Requirements
A minimum of 72 credit hours and a minimum overall GPA of 3.0 is required for the Ph.D. degree. In addition, all doctoral candidates must register for PHYL 7099 Dissertation for at least two semesters in order to graduate. The student is required to demonstrate intellectual command of the subject area of the graduate program and capability to carry out independent and original investigation in the area. The student must successfully defend a dissertation and be recommended by their program COGS for approval of their degree to the Dean of the Graduate School of Biomedical Sciences.

Physiology Track
First Year
Fall
IBMS 5000 Fundamentals Of Biomedical Sciences 8
IBMS 5008 Lab Rotations 2
Total Credit Hours: 10.0

Spring
IBMS 5008 Lab Rotations 2
PHYL 5041 Excitable Membranes 1
PHYL 5042 Cardiovascular Physiology 1
PHYL 5043 Respiratory & Renal Physiology 1
PHYL 5044 Metabolism/Hormones/GI System 1
Total Credit Hours: 6.0

Second Year
Fall
PHYL 6097 Research 1-12
PATH 5021 or CSAT 5095
Total Credit Hours: 4.0-15.0

Second Year
Spring
INTD 6002 Ethics In Research 0.5
PHYL 6091 Selected Topics Of Physiology 2
PHYL 6090 Seminar 1
PHYL 6097 Research 1-12
Qualifying Exam (QE) proposal due prior to May 1st.
Total Credit Hours: 4.5-15.5

Third Year
Fall
PHYL 6090 Seminar 1
PHYL 7099 Dissertation 1-12
Total Credit Hours: 2.0-13.0

Third Year
Spring
INTD 6002 Ethics In Research 0.5
PHYL 6091 Selected Topics Of Physiology 2
PHYL 6090 Seminar 1
PHYL 7099 Dissertation 1-12
Qualifying Exam (QE) proposal due prior to May 1st.
Total Credit Hours: 4.5-15.5

Fourth Year
Fall
PHYL 6090 Seminar 1
PHYL 7099 Dissertation 1-12
Total Credit Hours: 2.0-13.0

Fourth Year
Spring
PHYL 6090 Seminar 1
PHYL 7099 Dissertation 1-12
Total Credit Hours: 2.0-13.0

Fifth Year
Fall
PHYL 6090 Seminar 1
PHYL 7099 Dissertation 1-12
Total Credit Hours: 2.0-13.0
Fifth Year

Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>PHYL 6090  Seminar</td>
<td>1</td>
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<tr>
<td>PHYL 7099  Dissertation</td>
<td>1-12</td>
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</tbody>
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Total Credit Hours: 2.0-13.0

1 Students may take the full course but are only required to take three out of the four modules (PHYL 5041 Excitable Membranes, PHYL 5042 Cardiovascular Physiology, PHYL 5043 Respiratory & Renal Physiology, PHYL 5044 Metabolism/Hormones/GI System).

Other courses – Selected Topics in Physiology or coursework as desired by mentor.

All students are required to submit a dissertation research proposal the Spring semester following passing the Qualifying Exam. Dissertation research proposal is to be presented during the PHYL 6090 Seminar Spring Student Seminar course.

Students are required to attend Monday Physiology Department Seminars/Special Seminars followed by student roundtable luncheon.

Note: MD/PhD students must meet the same requirements as all other students in the Physiology Track, with the exception of Fall I courses.

PHYL 6091 Selected Topics in Physiology

At least two courses selected from among the offerings in:¹

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>PHYL 6091-01: Cardiovascular</td>
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<tr>
<td>PHYL 6091-03: Cell Biology in Neural Science</td>
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<tr>
<td>PHYL 6091-04: Endocrine and Metabolism</td>
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<td>PHYL 6091-05: Molecular Physiology</td>
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<td>PHYL 6091-07: Ion Channels in Disease</td>
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Courses that may be substituted for one of these selections:

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<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>INTD 5040</td>
<td>Fundamentals Of Neuroscience 1: Molecular, Cellular, &amp; Developmental Neuroscience</td>
</tr>
<tr>
<td>INTD 5043</td>
<td>Fundamentals Of Neuroscience 2: Systems Neuroscience</td>
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<tr>
<td>INTD 5081</td>
<td>Topics In Cardiovascular Research</td>
</tr>
<tr>
<td>INTD 7002</td>
<td>Neurobiology Of Learning And Memory</td>
</tr>
<tr>
<td>CSAT 6058</td>
<td>Neurobiology Of Aging</td>
</tr>
<tr>
<td>CSAT 5023</td>
<td>Development</td>
</tr>
<tr>
<td>CSAT 5024</td>
<td>RNA Biology and Genomics</td>
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<tr>
<td>CSAT 5026</td>
<td>Stem Cell Biology</td>
</tr>
</tbody>
</table>

¹ Not all selected topics are offered each semester, please discuss with Track Leader/Academic Coordinator for more details. Substituted courses will require approval from Track Leader/COGS.

Physiology Objectives/Program Outcomes

1. The student will be able to critically review and interpret research literature.

2. The student will be able to demonstrate proficient understanding of core physiological principles.

3. The student will be able to communicate effectively in verbal presentations.

4. The student will be able to demonstrate the ability to conduct independent research.

5. The student will be able to effectively communicate in writing.