ANATOMY, PH.D.

Saint Louis University’s doctoral degree in anatomy provides training in clinical human anatomy and independent research for individuals seeking a career in teaching and research at the medical school or university level.

Teaching faculty and mentors in Saint Louis University’s anatomy Ph.D. program are drawn from a select group of scientists and clinicians at the School of Medicine. The anatomy faculty are united by their extensive experience teaching and training young scientists, medical students and physicians-in-training.

Curriculum Overview

A total of 48 credits (36 credits of coursework and 12 credits of dissertation research) are required for graduation. A concentration in neurobiology provides training for students preparing for academic or professional careers in neuroscience-related areas.

Dissertation research is related to Saint Louis University’s Center for Anatomical Science and Education’s current research focus, including examining clinically relevant topics in neurobiology, pathology and/or biological structure and function.

Fieldwork and Research Opportunities

Graduate students in anatomy at SLU perform research projects by working with a faculty mentor whose research interests match their own. Doctoral students are expected to publish and present a minimum of two research projects.

Faculty members are engaged in multidisciplinary research of biological structure and function ranging from ultrastructural to gross anatomical levels, with a significant interest in clinically relevant anatomy and neurobiology. Other research interests include cell biology and pathobiology.

Careers

Possible careers for graduates with a Ph.D. in anatomy include medical doctors, allied health professionals and university professors.

Admission Requirements

Applicants are admitted on a competitive basis and must have a B.S. or B.A. degree from an accredited U.S. college or university with a minimum overall GPA of 3.0 and/or science GPA of 2.8. In addition, applicants must have a GRE general test score at the 40th percentile.

Application Requirements

- Application form and fee
- Transcript(s)
- Three letters of recommendation
- GRE G scores (GRE S optional)
- Résumé
- Interview
- Professional goal statement

Requirements for International Students

All admission policies and requirements for domestic students apply to international students. International students must also meet the following additional requirements:

- Demonstrate English Language Proficiency (https://catalog.slu.edu/academic-policies/office-admission/undergraduate/english-language-proficiency/)
- Financial documents are required to complete an application for admission and be reviewed for admission and merit scholarships.
- Proof of financial support that must include:
  - A letter of financial support from the person(s) or sponsoring agency funding the student’s time at Saint Louis University
  - A letter from the sponsor’s bank verifying that the funds are available and will be so for the duration of the student’s study at the University
- Academic records, in English translation, of students who have undertaken postsecondary studies outside the United States must include:
  - Courses taken and/or lectures attended
  - Practical laboratory work
  - The maximum and minimum grades attainable
  - The grades earned or the results of all end-of-term examinations
  - Any honors or degrees received.

WES and ECE transcripts are accepted.

Application Deadlines

Students should apply by March 1 for fall admission.

Tuition

<table>
<thead>
<tr>
<th>Tuition</th>
<th>Cost Per Credit</th>
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</thead>
<tbody>
<tr>
<td>Graduate Tuition</td>
<td>$1,310</td>
</tr>
</tbody>
</table>

Additional charges may apply. Other resources are listed below:

- Information on Tuition and Fees (https://catalog.slu.edu/academic-policies/student-financial-services/tuition/)
- Miscellaneous Fees (https://catalog.slu.edu/academic-policies/student-financial-services/fees/)
- Information on Summer Tuition (https://catalog.slu.edu/academic-policies/student-financial-services/tuition-summer/)

Scholarships and Financial Aid

For priority consideration for graduate assistantship, apply by Feb. 1.

For more information, visit the student financial services office online at https://www.slu.edu/financial-aid/index.php (https://www.slu.edu/financial-aid/).

Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAT 5000</td>
<td>Human Gross Anatomy</td>
<td>8</td>
</tr>
</tbody>
</table>
to be dropped from the Ph.D. program. In this case, the director of the
Failing the qualifying exam will result in the student being recommended
that they help evaluate the problem-solving skills of the student.

anatomy (gross anatomy, neuroanatomy, histology and embryology), and
be selected or created by the committee to ensure the questions are fair.
The committee will review the submitted questions and questions will
occur over a five-day period (excluding weekends).

or associate director shall chair the committee. The written test shall
graduate faculty, four of which shall be anatomists. The program director
proposal. An ad hoc exam committee will be constituted by the director

The qualifying exam is a written examination that is designed to test
the student’s fundamental knowledge of human structure and function,
critical analysis and thinking, and design of an independent research
proposal. An ad hoc exam committee will be constituted by the director
of the anatomy graduate program and include five members of the
graduate faculty, four of which shall be anatomists. The program director
or associate director shall chair the committee. The written test shall occur over a five-day period (excluding weekends).

The committee will request the faculty to submit questions on:
- Material covered in any of the coursework completed by the student
to date
- Research papers or reviews that will be provided to the student
- And/or philosophical matters related to the history of anatomy and
  medicine or national or world events that impact medical education
  and biomedical research.

The committee will review the submitted questions and questions will
be selected or created by the committee to ensure the questions are fair and
appropriate, that they test the student’s knowledge base for areas of
anatomy (gross anatomy, neuroanatomy, histology and embryology), and
that they help evaluate the problem-solving skills of the student.

Failing the qualifying exam will result in the student being recommended
to be dropped from the Ph.D. program. In this case, the director of the

anatomy graduate program can elect to offer the failed student the option
of completing a terminal master’s degree.

Once the student has passed the doctoral qualifying examination, the
student must register for Dissertation Research. A minimum of 12
credits are required for degree completion and typically occurs over 2-3
academic years. Initially, the student must identify a research project
under the guidance of a faculty member. A Ph.D. dissertation committee
will then be formed as the student prepares their research proposal.

A three-member Ph.D. dissertation committee, chaired by the student’s
primary adviser, will be appointed by the director of the anatomy
graduate program. The committee must include at least two members
of the anatomy graduate faculty. A third member of the committee can
be appointed by the graduate program director if they are graduate
faculty in other departments or at another university. It is the decision
of the anatomy graduate program director to accept the adviser’s
recommendation and to identify the final member of the committee. Once
the proposal has been approved by the Ph.D. dissertation committee it is
then submitted to the Office of Graduate Education.

**Neurobiology Concentration**

For a concentration in neurobiology, students must conduct dissertation
research in neurobiology and are required to complete at least 7 credits
from the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ANAT 6320</td>
<td>Developmental Neurobiology</td>
<td>2</td>
</tr>
<tr>
<td>ANAT 6670</td>
<td>Visual Neuroscience</td>
<td>2</td>
</tr>
<tr>
<td>PPY 5110</td>
<td>Introduction to Pharmacology</td>
<td>1</td>
</tr>
<tr>
<td>PATH 5010</td>
<td>Pathobiology</td>
<td>3-5</td>
</tr>
</tbody>
</table>

**Non-Course Requirements**

**Qualifying Examination and Defense**

After completing the core curriculum, Basic Research Techniques in
Anatomy and Principles of Biostatistics, the student must prepare for and
successfully pass the doctoral qualifying examination.

**Doctoral Qualifying Examination**

The qualifying exam is a written examination that is designed to test
the student’s fundamental knowledge of human structure and function,
critical analysis and thinking, and design of an independent research
proposal. An ad hoc exam committee will be constituted by the director
of the anatomy graduate program and include five members of the
graduate faculty, four of which shall be anatomists. The program director
or associate director shall chair the committee. The written test shall occur over a five-day period (excluding weekends).

The committee will request the faculty to submit questions on:

- Material covered in any of the coursework completed by the student
to date
- Research papers or reviews that will be provided to the student
- And/or philosophical matters related to the history of anatomy and
  medicine or national or world events that impact medical education
  and biomedical research.

The committee will review the submitted questions and questions will
be selected or created by the committee to ensure the questions are fair and
appropriate, that they test the student’s knowledge base for areas of
anatomy (gross anatomy, neuroanatomy, histology and embryology), and
that they help evaluate the problem-solving skills of the student.

Failing the qualifying exam will result in the student being recommended
to be dropped from the Ph.D. program. In this case, the director of the

Once the student has passed the doctoral qualifying examination, the
student must register for Dissertation Research. A minimum of 12
credits are required for degree completion and typically occurs over 2-3
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A three-member Ph.D. dissertation committee, chaired by the student’s
primary adviser, will be appointed by the director of the anatomy
graduate program. The committee must include at least two members
of the anatomy graduate faculty. A third member of the committee can
be appointed by the graduate program director if they are graduate
faculty in other departments or at another university. It is the decision
of the anatomy graduate program director to accept the adviser’s
recommendation and to identify the final member of the committee. Once
the proposal has been approved by the Ph.D. dissertation committee it is
then submitted to the Office of Graduate Education.

**Doctoral Oral Qualifying Examination**

The oral qualifying exam will be scheduled after the student has
submitted a detailed dissertation research proposal, conducted
preliminary experiments to substantiate the proposal and the dissertation
advisory committee formed. The committee will consist of five members
of the graduate faculty and will be approved by the program director. The
oral exam will be public and designed to test the student’s fundamental
knowledge of their proposed studies, background for the studies, and
critical analysis and thinking.

Prior to the doctoral student’s request for consideration for advancement
to candidacy, submission of their research proposal, formation of their
research committee, initiation of the major components of their proposed
doctoral research project, and registration for any research credits, the
student must have completed most of their required core or elective
coursework and successfully passed their preliminary/written qualifying
exam.

**Advancement to Candidacy**

Completion of the dissertation research project entails the following:
writing of the thesis, application for advancement to candidacy and
the dissertation defense. It shall be the responsibility of the student to
initiate their candidacy by filing out a candidacy form through the Office
of Graduate Education. The completed form must be returned by the
deadline stated in the graduate education calendar of deadlines.

Once the completed candidacy form has been processed by the Office
of Graduate Education, the thesis committee chair will receive ballots
for the oral defense of the thesis. The ballots are distributed to the other
committee members by the thesis committee chair when they vote on the
oral defense. Once the ballots are completed, signed and sealed, it is the
committee chairperson’s responsibility to deliver the ballots to the Office
of Graduate Education immediately following the defense.

**Dissertation Defense**

The defense of the dissertation provides an opportunity for the student
to formally present their findings to their committee, the faculty and
students in CASE, and to any family member or anyone from the general
public wishing to attend. Two weeks before the dissertation defense, an
electronic and print announcement of the date, time, location and title of
the defense will be publicized to all members of CASE. A final draft of the
student’s dissertation must be placed in the anatomy conference room.
for faculty and students to review at least seven working days prior to the defense.

The dissertation defense is two parts. First, the student will make an oral, PowerPoint presentation of no longer than 45 minutes duration where they present their research. Following the presentation, questions from the collective audience will be encouraged. Once all questions have been satisfactorily answered by the student, the audience is excused and the closed, or executive, part of the defense takes place with only the student and their committee present. The dissertation committee can ask detailed questions and expect the student to demonstrate thorough knowledge of their project and related research. Questions on general topics in anatomy, unrelated to their research, may also be asked. Following all questioning, the student is excused from the room and the committee members, without discussion, complete the defense ballot.

**Continuation Standards**

Students must maintain a cumulative GPA of 3.00 in all required graduate/professional courses.

**Learning Outcomes**

1. Graduates will be able to demonstrate:
   a. knowledge and application of the underlying concepts, advanced knowledge and analytical approaches used in general and advanced gross anatomy, microscopic anatomy, neuroanatomy, physiology and embryology;
   b. the application of current scientific literature, especially in areas representing gaps of knowledge, through framing hypotheses-driven experiments, independent reading and the completion of additional work; and
   c. the application of designing and conducting experiments and to analyze and interpret data.

2. Graduates will be able to demonstrate:
   a. the ability to gather data to verify the existence of a problem, conduct extended research/analysis into a problem/topic, evaluate the evidence, generate ideas for possible solutions and formulate a thesis based on analysis; and
   b. the ability to read materials carefully and analyze them critically

3. Graduates will be able to demonstrate:
   a. written communication skills with respect to clarity, use of appropriate grammar, syntax and vocabulary appropriate to the development of a NIH-style grant proposal; organizing research materials to support an original thesis; and presenting ideas and arguments clearly, logically and with an appropriate balance of text and graphic materials; and
   b. oral communication skills with respect to designing, organizing and presenting main points concisely and clearly; providing persuasive arguments, using data and information, that are appropriate for the audience and occasion; using language vocal variety, pronunciation and physical behaviors that support the verbal message for the audience and occasion; using visual aids appropriate for technical presentation and ability to answer audience questions.