

Anatomical Sciences

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Degree Awarded

Ph.D. in Anatomical Sciences

Web Site

<https://medicine.stonybrookmedicine.edu/anatomy>

Application

https://app.applyyourself.com/AYApplicantLogin/fl_ApplicantLogin.asp?id=sunysb-gs

Multidisciplinary Graduate Program in Anatomical Sciences

The Department of Anatomical Sciences, within the Health Sciences Center, offers a multidisciplinary graduate program leading to the Ph.D. degree. Students receive comprehensive training to prepare them for teaching and research in the areas of evolutionary morphology, systematics, functional morphology, musculoskeletal biology, and vertebrate paleontology. Graduate students are guided through a program of courses designed for their particular needs. In this regard, the Department of Anatomical Sciences interacts not only with other departments in the School of Medicine but also with those in the College of Arts and Sciences (e.g., Anthropology, Geosciences, and Ecology and Evolution), as well as other regional doctoral programs (City University of New York, American Museum of Natural History, Richard Gilder Graduate School).

The program trains students in the analysis and interpretation of gross vertebrate structure with the goal of testing hypotheses in systematics, paleoecology and adaptation. Training and research focus on applying an evolutionary perspective to the study of morphology, including functional morphology and phylogenetic systematics. Field-based projects for the discovery of new fossils are typically underway every year. Both the locomotor and the craniodental anatomical systems are regions of current interest and investigation within the program. Several faculty in the department specialize in the application of experimental and quantitative techniques to the analysis of the relationship between form and function. Studies of skeletal adaptations are also facilitated by collaboration with the Musculoskeletal Research Laboratory of the Department of Orthopaedics. Questions of systematics are approached at different levels, ranging from alpha taxonomy to higher-order relationships and we provide training and contemporary methods for phylogenetic systematics and biogeography. Students in the program have the opportunity to master a variety of research methods and analytical strategies: electromyography, cineradiography, kinematics and kinetics, in vivo bone strain measurement, quantitative morphology including scaling (allometry) and multivariate morphometrics, phylogenetic systematics, biogeography, scanning electron microscopy and tandem-scanning, CT-based anatomical reconstructions, reflected-light microscopy, behavioral ecology, and principles of paleontological fieldwork.

Admission Requirements of Anatomical Sciences Department

In addition to the minimum Graduate School requirements, the following are required:

- A. A bachelor's degree typically in a field with ties to research in our department.
- B. Letters of reference.
- C. Results of the Graduate Record Examination (GRE) General Test and TOEFL for non-native speakers of English.
- D. Acceptance by the Department of Anatomical Sciences and by the Graduate School.

Important Note:

Anatomical Sciences has an application deadline in early December each year (please check the website for the exact date). Please note that this is earlier than the typical University Graduate School deadline of January 15. All applicants must submit by the December deadline to be considered.

Facilities of Anatomical Sciences Department

The department has exceptionally well-equipped research facilities. These include facilities for experimental study in animal locomotion such as telemetered electromyography; cinematographic and cineradiographic motion analysis equipment; force-plates; scanning and transmission electron microscopes; tandem-scanning, reflected-light microscopes; three-dimensional reflex microscopes; and two-dimensional and three-dimensional sonic digitizers. For students with a focus on paleontology, the department has a state of the art Vertebrate Fossil Preparation laboratory with contemporary equipment for preparation, molding and casting original fossil material. The department also has original fossil

collections, extensive cast collections, and several ongoing paleontological field projects in the western interior of North America, North Africa, and Asia.

Anatomical Sciences does not accept students whose goal is a master's degree. In exceptional instances, a student already in the program may be awarded an M.S. degree upon completing an approved course of study, including a minimum of 30 graduate credit hours, and either passing a comprehensive examination, or submitting and defending a master's thesis.

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Requirements for the Ph.D. Degree in Anatomical Sciences

In addition to the minimum requirements of the Graduate School, the following are required:

A. Formal Course Requirements

The following courses are required for all students in the program:

1. Evolutionary Anatomy (Anatomy and Embryology) HBA 541 (8 credits, fall)
2. Statistics course approved by the advisor or department.
3. Integrity in Science GRD 500 (1 credit, spring),
required by the Graduate School
4. Practicum in Teaching (HBA 695, 1-4 credits)

In addition, students are required to take three elective courses chosen in consultation with the student's advisor. These are typically selected from among those given by the Department of Anatomical Sciences or other departments at Stony Brook University. However, with approval of the student's advisor and the Graduate Program Director, elective courses may also be taken at other institutions. Click here to see a what a typical schedule might look like

Examples electives include:

Anatomy Department Electives

1. Studies in Functional Morphology HBA 566 (2 credits, spring, even years)
2. Primate Evolution HBA 564 (4 credits, spring, even years)
3. Human Evolution HBA 565 (4 credits, fall, even years)
4. Comparative Anatomy of Primates HBA 582 (4 credits, spring)
5. Aspects of Animal Mechanics HBA 563 (2 credits, spring, odd years)
6. Vertebrate Evolution HBA 550 (4 credits, spring, odd years)
7. Systematics, Biogeography and Comparative Methods HBA 551, (4 credits, spring, even years)

Example Non-Anatomy Department Electives:

1. Principles of Evolution BEE 551 (4 credits, fall),
2. Macroevolution BEE 561 (3 credits, spring, odd years),
3. Geometric Morphometrics BEE 564 (3 credits, fall, even years)
4. Molecular Evolution BEE 565 (3 credits, spring, odd years)
5. Multivariate Analysis in Biology BEE 553 (3 credits, fall)
6. Graduate Genetics BGE 510 (3 credits, spring)
7. Principles of Development MCB 657 (3 credits, fall)

Depending on a student's area of specialization, he/she may be required to take additional courses, to be determined in consultation with the advisor. A student must achieve a grade of B or higher in each of the required courses, and must maintain a B average or higher in all elective courses (note, as stated above, 3 electives are a required component of the Ph.D. program).

B. Preliminary Examination

Upon completion of formal courses (normally at the beginning of the fourth semester), each student is given an oral preliminary examination. Depending on the area of concentration, the examination covers human anatomy, embryology and one or more elective topics (e.g., vertebrate evolution).

C. Advancement to Candidacy

The faculty will recommend a student to the Graduate School for advancement to candidacy upon satisfactory completion of all required coursework and the preliminary examination. The student then becomes a formal candidate for the Ph.D.

D. Dissertation Proposal Examination

Following advancement to candidacy a student must select a dissertation committee consisting of at least three members of the Department of Anatomical Sciences (one of whom is the student's advisor), and at least one person from outside the department (either at Stony Brook University or another institution). Students must formally present a list of his/her committee members to the Graduate Program Director.

In consultation with this committee the student prepares a dissertation proposal. The dissertation proposal examination consists of an oral presentation of this proposal to the department as a whole, followed by an oral defense before the dissertation committee. The student must make the proposal available to the committee at least three weeks prior to the defense and to the faculty at large (by depositing it with the Graduate Program Coordinator), two weeks prior to the defense. This examination must occur no later than twelve months after passing the oral preliminary examination. Change to this deadline requires a formal petition to the faculty and is only granted under extenuating circumstances.

E. Ph.D. Dissertation

Students complete their dissertation research in Years 4 and 5. Students, under the supervision of his/her Dissertation Committee, perform the research leading to the preparation of their written dissertation. The dissertation must contain the results of an original and significant investigation.

F. Dissertation Defense

Following completion of the dissertation, and with the approval of the dissertation committee, a student must present his/her findings in a formal public oral defense. The student must make the written dissertation available to the dissertation committee at least 3 weeks prior to the defense and to the faculty at large (by depositing it with the Graduate Program Coordinator), 2 weeks prior to the defense. The defense is not chaired by the student's advisor, but rather by another member of the dissertation committee. Following the oral presentation of results and questioning by the audience, the student defends his/her results before the dissertation committee.

G. Teaching Requirement

Every student is required to teach medical human gross anatomy (HBA 531) at least once before graduation. In addition, students receiving a teaching assistantship are required to teach.

H. Residence Requirement

The University requires at least two consecutive semesters of full-time graduate study. Generally, the demands of the course of study necessitate a longer period of residence. However, pursuit of a degree on a part-time basis will be considered under special circumstances.

Faculty of Anatomical Sciences

Distinguished Professor

Fleagle, John G., Ph.D., 1976, Harvard University: Evolutionary biology of higher primates; vertebrate paleontology; behavioral and experimental analysis of comparative musculoskeletal anatomy; skeletal growth and development.

Emeritus Distinguished Service Professor

Krause, David W.⁴, Ph.D., 1982, University of Michigan: Vertebrate paleontology; mammalian evolution; functional morphology of masticatory and locomotor systems.

Emeritus Distinguished Teaching Professors

Jungers, William L., Ph.D., 1976, University of Michigan: Paleoanthropology; comparative primate anatomy; biomechanics; primate paleontology and systematics.

Emeritus Stern, Jack T., Jr., Chairperson. Ph.D., 1969, University of Chicago: Functional gross morphology; relationship between primate locomotor behavior and structure; human muscle function in relation to athletic activity and orthopaedics; radiotelemetered electromyography.

Emeritus Professors

Demes, A. Brigitte, Ph.D., 1982, University of Bochum, Federal Republic of Germany: Biomechanics; functional morphology; scaling effects on locomotion.

Professors

Larson, Susan G., Ph.D., 1982, University of Wisconsin: Functional morphology of human and nonhuman primate locomotor systems; human and primate evolution; telemetered electromyography.

O'Leary, Maureen A.⁴, Ph.D., 1997, Johns Hopkins University: Vertebrate paleontology; phylogenetic systematics; mammalian evolution.

Susman, Randall L., Ph.D., 1976, University of Chicago: Functional morphology and behavior of primates; evolution of apes and humans; gross anatomy.

Associate Professors

Kley, Nathan J., Ph.D., 2001, University of Massachusetts Amherst: Functional morphology and evolution of feeding and locomotor systems in vertebrates. Phylogenetic origin, interrelationships and early evolution of snakes.

Turner, Alan H., Ph.D., 2008, Columbia University: Vertebrate paleontology; phylogenetic systematics, biogeography, archosaur evolution.

Assistant Professors

Eric Wilberg, Ph.D., 2012, University of Iowa: Vertebrate paleontology, crocodylian biology.

Stephanie Maiolino, Ph.D., 2015 Stony Brook University: Physical anthropology, primate evolution.

Adjunct and Joint Faculty

Brink, Peter R.², Ph.D., 1976, University of Illinois: Physiology and biophysics of junctional and excitable membranes.

Doran-Sheehy, Diane M.1, Ph.D., 1989, University at Stony Brook: Behavior and ecology of African apes; relationship of positional behavior and morphology.

Grine, Federick E.¹, Ph.D., 1984, University of Witwatersrand, South Africa: Hominid evolution; functional morphology of the masticatory system; vertebrate paleontology; dental structure and comparative odontology.

Leakey, Maeve, Ph.D., 1968, University of North Wales: Evolution of hominoids; evolution of Late Cenozoic faunas in East Africa.

Martin, Lawrence B., Dean of the Graduate School.1 Ph.D., 1983, University of London, England: Primate evolution; thickness, development, and microstructure of dental enamel; neogene vertebrate paleontology.

Mittermeier, Russell, Ph.D., 1977, Harvard University: Ecology and behavior of primates; primate conservation.

Rubin, Clinton T.³, Ph.D., 1982, Bristol University, England: Structural adaptation in bone; skeletal remodeling and morphology.

Number of teaching, graduate, and research assistantships annually: 4-6

- 1) Joint appointment, Department of Anthropology
- 2) Joint appointment, Department of Physiology
- 3) Joint appointment, Department of Orthopaedics
- 4) Joint appointment, Department of Earth and Space Sciences

NOTE: The course descriptions for this program can be found in the corresponding program PDF or at COURSE SEARCH.