Human Physiology

Li-Shan Chou, Department Head
541-346-4107
541-346-2841 fax
122 Esslinger Hall

Human physiology is the science of the mechanical, physical, and biochemical function of humans, and serves as the foundation of modern medicine. As a discipline, it connects science, medicine, and health, and creates a framework for understanding how the human body adapts to stresses, physical activity, and disease.

Human physiology and anatomy are closely related—anatomy is the study of form, physiology is the study of function, and form and function are intrinsically linked. The study of human physiology integrates knowledge across many levels, including biochemistry, cell physiology, and organ systems. Contemporary research in human physiology explores new ways to maintain or improve the quality of life, the development of new medical therapies and interventions, and the unanswered questions about how the human body works. The Department of Human Physiology serves its students by providing strong training in human physiology and anatomy to prepare them for careers in medicine, allied health professions, and biomedical research.

Faculty

Li-Shan Chou, professor. BS, 1987, Tatung Institute of Technology; MS, 1990, PhD, 1995, Illinois, Chicago. (2000)

Anita Christie, assistant professor. BS, 2001, MS, 2003, Brock; PhD, 2009, Massachusetts, Amherst. (2011)

Sierra Dawson, senior lecturer. BS, 1995, MS, 2000, PhD, 2004, Oregon. (2003)

Hans Dreyer, associate professor. BS, 1998, California State, Long Beach; MS, 2002, PhD, 2004, Southern California. (2009)

Grace Golden, lecturer. BS, 1989, MS, 1991, Oregon; PhD, 2007, Oregon State. (2009)

Michael Hahn, associate professor. BS, 1996, Colorado Mesa; MS, 2000, Iowa State; PhD, 2003, Oregon. (2012)

John Halliwill, professor. BS, 1991, Ohio State; PhD, 1995, Medical College of Virginia. (2002)

Robin Hopkins, instructor. BS, 2005, Simon Fraser; MS, 2009, Western Ontario; PhD, 2014, British Columbia. (2014)

Adrianne Huxtable, assistant professor. BS (Honours), 2003, British Columbia; PhD, 2009, Alberta. (2015)

Andrew Karduna, professor. BS, 1989, Massachusetts Institute of Technology; MS, 1991, Johns Hopkins; PhD, 1995, Pennsylvania. (2002)

Andrew Lovering, associate professor. BS, 1995, PhD, 2003, Texas Tech. (2007)

Philip Matern, instructor. BS, 2003, Gonzaga; MS, 2005, Central Washington; PhD, 2015, California, Davis. (2014)

Carrie McCurdy, assistant professor. BS, 1998, Notre Dame; PhD, 2004, Wisconsin, Madison.(2013)

Christopher Minson, Kenneth and Kenda Singer Endowed Professor in Human Physiology. BS, 1989, Arizona; MA, 1993, San Diego State; PhD, 1997, Pennsylvania State. (2000)

Jon Runyeon, senior instructor. BS, 1996, MS, 2010, Oregon. (2012)

Ashley Walker, assistant professor. BS, 2003, Oregon State; PhD, 2010, Colorado, Boulder. (2017)

Courtesy

Mark Chesnutt, courtesy research associate. BS, 1982, Pacific Lutheran; MD, 1986, Oregon Health and Science. (2012)

Michael Colasurdo, courtesy professor. BS 1980, Portland State; MD, 1984, Oregon Health and Science. (2009)

Dennis Collis, courtesy professor. BS, 1959, Grinnell College; MD, 1963, Washington (St. Louis). (2007)

Mathews Fish, courtesy professor. AB, 1956, California, Berkeley; MD, 1959, California Medical, San Francisco. (2002)

Daniel Fitzpatrick, courtesy associate professor. BS, 1991, MS, 1993, MD, 1997, Iowa. (2007)

Eben Futral, courtesy research associate. BS, 1988, Stanford; MBA, 1999, Arizona State. (2015)

Igor Gladstone, courtesy professor. BS, 1973, MD, 1981, Washington (Seattle). (2009)

Randall Goodman, courtesy research assistant. BS, 1994, Oregon. (2010)

Jerold Hawn, courtesy professor. BS, 1963, Santa Clara; MD, 1967, Georgetown. (2009)

Stanley James, courtesy professor. BS, 1953, MD, 1962, Iowa. (1979)

Brian Jewett, courtesy associate professor. BS, 1990, MS, 1991, Stanford; MD, 1995, Vanderbilt. (2007)

Donald Jones, courtesy professor. BS, 1969, Centenary (Hackettstown); MD, 1973, Louisiana State. (1983)

Paul Kaplan, courtesy research associate; university physician. AB, 1970, Stanford; MD, 1974, California, Los Angeles. (2005)

Vern Katz, courtesy professor. BA, 1971, MD, 1979, California, Los Angeles. (2001)

Peter Kosek, courtesy professor. BA, 1984, Grinnell College; MD, 1988, California, Los Angeles. (2009)

Brett "Brick" Lantz, courtesy professor. BA, 1981, Stanford; MD, 1985, Oklahoma. (2007)

Samuel Lau, courtesy professor. BS, 1984, MD, 1988, Creighton. (2009)

Fuzhong Li, courtesy senior research associate. BS, 1994, Shanghai; MS, 1990, Oregon; PhD, 1996, Oregon State. (2013)

Victor Lin, courtesy associate professor. BS, 1988, Massachusetts Institute of Technology; MS, 1991, California, Berkeley; MD, California, San Francisco. (2002)

Elizabeth McCorkle, courtesy research associate. BA, 1987, Rollins College; MD, 1992, Augusta. (2016)

John Melton, courtesy senior research associate. BS, 1979, MD, 1985, New Mexico. (2011)

Gregory Moore, courtesy assistant professor. BS, 1995 Southern Methodist; MS, 1999, Oregon State; MD, 2003, Texas, San Antonio. (2013)

Brian Nichols, courtesy instructor. BS, 1987, MS, 1989, Oregon. (2001)

Richard Padgett, courtesy professor. BS, 1984, East Carolina; MD, 1988, North Carolina, Chapel Hill. (2005)

Joshua Pfeiffer, courtesy assistant professor. BS, 2003, MD, 2008, Washington (Seattle). (2015)

Matthew Shapiro, courtesy research associate. BA, 1979, Cornell; MD, 1983, Columbia. (2015)

Kenneth M. Singer, courtesy professor; team physician. BS, 1961, Massachusetts Institute of Technology; MD, 1965, Columbia University College of Physicians and Surgeons. (1994)

Robert Tearse, courtesy professor. BA, 1973, Stanford; MD, 1977, California, Davis. (2013)

Kimberly Terrell, courtesy instructor. BS 1981, MS, 1983, Oregon. (2006)

Brad Wilkins, courtesy instructor. BS, 1993, Oregon State; MS, 1996, Northern Michigan; PhD, 2003, Oregon. (2014)

Emeriti

Barry T. Bates, professor emeritus. BSE, 1960, Princeton; MEd, 1971, East Stroudsburg; PhD, 1973, Indiana. (1974)

Gary A. Klug, professor emeritus. BS, 1970, MS, 1973, Wisconsin, La Crosse; PhD, 1980, Washington State. (1985)

Louis R. Osternig, professor emeritus. BS, 1965, MS, 1967, California State, Hayward; PhD, 1971, Oregon. (1971)

Richard K. Troxel, senior instructor emeritus. BS, 1975, MS, 1977, Oregon. (1976)

Marjorie Woollacott, professor emerita. BA, 1968, PhD, 1973, Southern California. (1980)

The date in parentheses at the end of each entry is the first year on the University of Oregon faculty.

- **Bachelor of Arts**
- **Bachelor of Science**

Undergraduate Studies

The department offers a program leading to either a bachelor of science (BS) or a bachelor of arts (BA) degree.

The rigorous undergraduate curriculum provides an in-depth exploration of the field as well as a strong foundation for future studies. Majors complete sequences in biology, chemistry, physics, and mathematics, in addition to upper-level course work in human physiology.

Preparation

High school preparation should include a strong background in chemistry, biology, mathematics, and physics. Students involved in Advanced Placement (AP) or International Baccalaureate (IB) programs can complete some lower division requirements by earning sufficient test scores. However, some graduate degree programs may require students to complete these courses at the collegiate level.

Transfer Students

Before transferring, students should complete as many general-education requirements and lower-division major requirements as possible, including general chemistry, general biology, general physics, and mathematics. Students should ensure that courses transfer specifically as required sequences. The University's Transfer Course Equivalency (http://registrar.uoregon.edu/transfer-students) tool is a helpful resource.

The anatomy and physiology sequence (HPHY 321–325) provides the bulk of upper-division credits human physiology majors complete. The courses are the foundation on which students learn the human physiology culture and expectations, and are designed to prepare students for senior-level course work in the major. As a result, HPHY 321–325 must be completed in residence at the University of Oregon; transfer students should plan on taking the courses on the UO campus.

Scholarships

Numerous scholarships are available; a complete list is available on the department website.

Careers

A degree in human physiology prepares students to be critical thinkers who can independently assess their own personal health, using the guiding principles of scientific inquiry as a model for understanding the world around them. Students seeking a career in medicine, dentistry, physical therapy, or other health professions should work closely with the human physiology undergraduate advisor as well as health professions advisors to plan their program of study to meet the specific admission requirements of the postgraduate schools in which they are interested. Information on additional courses that may be required for graduate programs is available from the Health Professions Program (http://healthprofessions.uoregon.edu/health-fields) website.

Bachelor of Arts Degree Requirements

Code	Title	Credits
Lower-Division Requirements		
CH 221–223 or CH 224H–226H	General Chemistry [1] Honors General Chemistry	12
PHYS 201–203 or PHYS 251–253	General Physics Foundations of Physics I	12
CH 227–229 or PHYS 204–206	General Chemistry Laboratory Introductory Physics Laboratory	6
BI 211–213	General Biology I-III (may substitute BI 214 for BI 213)	12-15

or BI 281H–283H	Honors Biology I-III	
MATH 246	Calculus for the Biological Sciences I [1]	4
or MATH 251	Calculus I	
HPHY 211	Medical Terminology	3
HPHY 212	Evidence, Inference, and Biostatistics	4
Upper-Division Requirements		
HPHY 321	Human Anatomy I [2]	5
HPHY 322	Human Physiology I [2]	5
HPHY 323	Human Anatomy II [2]	5
HPHY 324	Human Physiology II [2]	5
HPHY 325	Human Anatomy and Physiology III [2]	5
HPHY 371	Physiology of Exercise	4
Upper-Division Electives		16
Select at least two of the following:		
HPHY 333	Motor Control	
HPHY 362	Tissue Injury and Repair	
HPHY 381	Biomechanics	
HPHY 399	Special Studies: [Topic]	
ANTH 362	Human Biological Variation	
ANTH 366	Human Osteology Laboratory	
ANTH 369	Human Growth and Development	
BI 309	Tropical Diseases in Africa	
BI 320	Molecular Genetics	
BI 322	Cell Biology	
BI 358	Investigations in Medical Physiology	
BI 360	Neurobiology	
CH 360	Physiological Biochemistry	
CH 462	Biochemistry	
Select at least one of the following capstone courses:		
HPHY 410	Experimental Course: [Topic]	
HPHY 412	Sleep Physiology	
HPHY 413	Muscle Structure, Function, and Plasticity	
HPHY 414	Muscle Metabolism	
HPHY 433	Neurophysiology of Concussion	
HPHY 434	Movement Disorders	
HPHY 441		
HPHY 442		
HPHY 460		
HPHY 462	Therapeutic Techniques	
HPHY 470	Environmental Physiology	
HPHY 472	Science of Athletic Performance	
HPHY 473	High Altitude Physiology and Medicine	
HPHY 485		
HPHY 486	Orthopedic Biomechanics	
Select any of the following:		
HPHY 401	Research: [Topic]	
HPHY 403	Thesis	
HPHY 404	Internship: [Topic]	
HPHY 405	Reading and Conference: [Topic]	
HPHY 406	Special Problems: [Topic]	
HPHY 408	Workshop: [Topic]	
HPHY 409	Practicum: [Topic]	
HPHY 409	Practicum: [Topic] (Anatomy and Physiology Teaching Assistant)	
HPHY 420	Human Anatomy Dissection	

1 Should be taken in the first year.

2 Must be taken in residence at the University of Oregon.

Bachelor of Science Degree Requirements

Code	Title	Credits
Lower-Division Requirements		
CH 221–223	General Chemistry [1]	12
or CH 224H–226H	Honors General Chemistry	
PHYS 201–203	General Physics	12
or PHYS 251–253	Foundations of Physics I	
CH 227–229	General Chemistry Laboratory	6
or PHYS 204–206	Introductory Physics Laboratory	
BI 211–213	General Biology I-III (may substitute BI 214 for BI 213)	12-15
or BI 281H–283H	Honors Biology I-III	
MATH 246	Calculus for the Biological Sciences I [1]	4
or MATH 251	Calculus I	
HPHY 211	Medical Terminology	3
HPHY 212	Evidence, Inference, and Biostatistics	4
Upper-Division Requirements		
HPHY 321	Human Anatomy I [2]	5
HPHY 322	Human Physiology I [2]	5
HPHY 323	Human Anatomy II [2]	5
HPHY 324	Human Physiology II [2]	5
HPHY 325	Human Anatomy and Physiology III [2]	5
HPHY 371	Physiology of Exercise	4
Upper-Division Electives		16
Select at least two of the following:		
HPHY 333	Motor Control	
HPHY 362	Tissue Injury and Repair	
HPHY 381	Biomechanics	
HPHY 399	Special Studies: [Topic]	
ANTH 362	Human Biological Variation	
ANTH 366	Human Osteology Laboratory	
ANTH 369	Human Growth and Development	
BI 309	Tropical Diseases in Africa	
BI 320	Molecular Genetics	
BI 322	Cell Biology	
BI 358	Investigations in Medical Physiology	
BI 360	Neurobiology	
CH 360	Physiological Biochemistry	
CH 462	Biochemistry	
Select at least one of the following capstone courses:		
HPHY 410	Experimental Course: [Topic]	
HPHY 412	Sleep Physiology	
HPHY 413	Muscle Structure, Function, and Plasticity	

HPHY 414	Muscle Metabolism
HPHY 433	Neurophysiology of Concussion
HPHY 434	Movement Disorders
HPHY 441	
HPHY 442	
HPHY 460	
HPHY 462	Therapeutic Techniques
HPHY 470	Environmental Physiology
HPHY 472	Science of Athletic Performance
HPHY 473	High Altitude Physiology and Medicine
HPHY 485	
HPHY 486	Orthopedic Biomechanics
Select any of the following:	
HPHY 401	Research: [Topic]
HPHY 403	Thesis
HPHY 404	Internship: [Topic]
HPHY 405	Reading and Conference: [Topic]
HPHY 406	Special Problems: [Topic]
HPHY 408	Workshop: [Topic]
HPHY 409	Practicum: [Topic]
HPHY 409	Practicum: [Topic] (Anatomy and Physiology Teaching Assistant)
HPHY 420	Human Anatomy Dissection

[1] Should be taken in the first year.

[2] Must be taken in residence at the University of Oregon.

For additional course options, recent additions to course offerings, and sample four-year programs of study, visit the department office or the department website. (http://physiology.uoregon.edu)

Courses required for the major must be taken for letter grades and passed with grades of mid-C or better. Required preparatory and upper-division core courses may be repeated only once, including attempts that result in a grade of "W" (withdrawal). Students must maintain at least an overall 2.00 grade point average in courses required for the major.

Additional requirements for the bachelor's degree are described in the **Bachelor's Degree Requirements** section of this catalog.

Honors

To apply to graduate with departmental honors, a student must have a GPA of 3.50 or better in courses applied toward the human physiology degree requirements and complete an honors thesis under the supervision of a human physiology thesis committee. In addition, human physiology majors enrolled in the Robert Donald Clark Honors College at the University of Oregon are eligible to complete an honors thesis through that program.

Four-Year Degree Plan

The degree plan shown is only a sample of how students may complete their degrees in four years. There are alternative ways. Students should consult their advisor to determine the best path for them.

The bachelor of science is shown below. A bachelor of arts in human physiology may be earned by completing (or demonstrating proficiency in) two years of a foreign language.

Bachelor of Science in Human Physiology

Course	Title		Credits Milestones
First Year			
Fall			
MATH 112	Elementary Functions		4
CH 221	General Chemistry I		4
CH 227	General Chemistry Laboratory	Students may choose to complete either a year of chemistry lab or physics lab.	2
Elective course			1
General education course			4
	Credits		**15**
Winter			
MATH 251 or MATH 246	Calculus I or Calculus for the Biological Sciences I		4
CH 222	General Chemistry II		4
CH 228	General Chemistry Laboratory		2
WR 121	College Composition I		4
Elective course			2
	Credits		**16**
Spring			
MATH 243	Introduction to Methods of Probability and Statistics	Not a human physiology requirement, but many graduate programs will require it.	4
CH 223	General Chemistry III	General Chemistry and Calculus should be complete by the end of the first year.	4
CH 229	General Chemistry Laboratory		2
Elective Course			2
General education course			4
	Credits		**16**
	Total Credits		**47**

Course	Title	Milestones	Credits
Second Year			
Fall			
BI 211	General Biology I: Cells		4
WR 122 or WR 123	College Composition II or College Composition III		4
Elective course			4
General education course			4
	Credits		**16**
Winter			
BI 212	General Biology II: Organisms		4
HPHY 211	Medical Terminology		3
Elective course			4
General education course			4
	Credits		**15**
Spring			
HPHY 212	Evidence, Inference, and Biostatistics	BI 211, BI 212, HPHY 211, and HPHY 212 should be complete by the end of the second year.	4
BI 213	General Biology III: Populations	Students may choose to complete either BI 213 or BI 214 (offered summer session)	4
Elective course			4
General education course			4
	Credits		**16**
Summer			
BI 214	General Biology IV: Mechanisms	Students may choose to complete either BI 214 or BI 213 (offered spring term)	4
	Credits		**4**
	Total Credits		**51**

Course	Title	Milestones	Credits
Third Year			
Fall			
HPHY 321	Human Anatomy I		5
HPHY 322	Human Physiology I		5
Upper-division elective courses			3
	Credits		**13**
Winter			
HPHY 323	Human Anatomy II		5
HPHY 324	Human Physiology II		5
Upper-division elective courses			3
	Credits		**13**
Spring			
HPHY 325	Human Anatomy and Physiology III		5
HPHY 371	Physiology of Exercise	HPHY 321–325 as well as HPHY 371 should be complete by the end of the third year.	4
General education course			4
Upper-division elective course			2
	Credits		**15**
	Total Credits		**41**

Course	Title	Milestones	Credits
Fourth Year			
Fall			
HPHY List A-fulfilling course		For more information, visit http://physiology.uoregon.edu/undergraduate/student-guide/major-requirements/	4
PHYS 201	General Physics	Students who did not opt to complete the chemistry lab will need to complete a year of physics lab	4
General education course			4
Upper-division elective course			3
	Credits		**15**

Winter			
HPHY List A-fulfilling course		For more information visit http://physiology undergradu student-guide/major-requiremer	4
HPHY List B-fulfilling course		For more information, visit http://physiology.uoregon.edu/undergraduate/student-guide/major-requirements/	4
PHYS 202	General Physics		4
Upper-division elective course			3
	Credits		**15**
Spring			
HPHY List A- or B-fulfilling course		For more information, visit http://physiology.uoregon.edu/undergraduate/student-guide/major-requirements/	4
PHYS 203	General Physics		4
Upper-division elective course			3
General education course			4
	Credits		**15**
	Total Credits		**45**

- **Master of Science: Athletic Training Emphasis**
- **Master of Science–Doctor of Philosophy: Research-Intensive Emphasis**

Graduate Studies

The Department of Human Physiology offers two graduate programs: the athletic training MS program and the research-intensive MS-PhD program.

Athletic Training MS Program

The department offers a graduate program in human physiology with an emphasis in athletic training leading to the master of science (MS). The primary goal of this program is to provide classroom and clinical experiences that will allow entry-level certified athletic trainers to grow into professionals with the experience and confidence to be great clinicians. Providing students with advanced clinical skills is our hallmark. The program also provides students with the opportunity to grow as leaders, teachers, and researchers. Admission is granted only to students who are certified by the CAATE Board of Certification or who have qualified for the certification examination. Graduate employee (GE) positions are available for highly qualified students who are certified as athletic trainers. The GE award provides a full tuition waiver and a monthly stipend that varies in amount according to the assignment. Employment settings include intercollegiate athletics, club and recreational sports, and teaching. Qualified students can find more information at the Graduate Studies in Athletic Training website (http://pages.uoregon.edu/uogradat). (http://pages.uoregon.edu/uogradat)

Master of Science Degree Requirements: Athletic Training

HPHY 520	Human Anatomy Dissection	2
HPHY 533	Neurophysiology of Concussion	4
HPHY 570	Environmental Physiology	4
HPHY 611	Professional Skills I: Effective Teaching	1
HPHY 660	Basic Science in Clinical Decisions	4
HPHY 661	Manual Therapy: Movement Patterns, Core Stability	2
HPHY 662	Manual Therapy: Spine, Lower Quadrant	2
HPHY 669	The Female Athlete	4
HPHY 671	Therapeutic Restoration of Biomotor Abilities	3
EDUC 614	Educational Statistics	4
HPHY 607	Seminar: [Topic] (Administrative Skills for Clinical Careers)	1
HPHY 607	Seminar: [Topic] (Clinical Research Presentations [two terms])	2
HPHY 607	Seminar: [Topic] (Contemporary Clinical Techniques I,II)	2
HPHY 607	Seminar: [Topic] (Current Professional Topics)	1
HPHY 607	Seminar: [Topic] (Evidence-Based Clinical Practice and Research)	2
HPHY 607	Seminar: [Topic] (Human Physiology [six terms])	6
HPHY 607	Seminar: [Topic] (Leadership Development)	1
HPHY 609	Practicum: [Topic[(Sports Medicine)	3
Select one of the following:		4
HPHY 601	Research: [Topic]	
HPHY 606	Special Problems: [Topic]	
HPHY 609	Practicum: [Topic[(Preceptor)	
Other human physiology courses		
Total Credits		**52**

Exit Requirement

All students participate in a comprehensive defense of their advanced clinical skills during spring term of their graduating year. In addition, they select one of the following two options as their graduation exit requirement:

- **Option 1.** Comprehensive written and oral exams (completed during the final term of study), one-term (4-credit minimum) research experience, and literature review or evidence-based practice manuscript submitted for publication.
- **Option 2.** Original research study conducted, and manuscript submitted for publication.

Additional Requirements

Required courses must be taken for letter grades and passed with grades of B– or better. Students must maintain at least a 3.00 grade point average each term, and will not be eligible to hold a GTF position, take comprehensive exams, or graduate without a cumulative GPA of 3.00. Additional university master's degree requirements are described under Master's Degrees in the **Graduate School** section of this catalog.

Research-Intensive Master of Science–Doctor of Philosophy Program

The department offers a graduate program in human physiology with an emphasis on research leading through the master of science (MS) degree to the doctor of philosophy (PhD) degree. The goal is to provide classroom and research experiences that turn students into professionals with the knowledge and experience to be superior researchers or become university-level educators. This is an individualized program with a strong emphasis on research. Decisions on accepting applicants to the graduate program are made by the faculty members, and are based on available laboratory space and financial support—both of which vary greatly from year to year. Graduate teaching and research fellowships (GTF) are available for highly qualified students to teach undergraduate laboratories or assist in research projects. The GTF award provides a full-tuition waiver and a monthly stipend that varies in amount according to the assignment. For more information, visit the department website.

Master of Science Degree Requirements

HPHY 611–613	Professional Skills I-III	3
HPHY 621–623	Systems Physiology I-III	12
HPHY 607	Seminar: [Topic] [1]	1-5
EDUC 614	Educational Statistics [2]	4
EDUC 640	Applied Statistical Design and Analysis [2]	4
Human physiology courses or other courses most appropriate to student's line of study [3]		4
Total Credits		**28-32**

1. Must register for course every term of enrollment, with one term possibly waived by the director of graduate studies to accommodate the student's research activities or other extenuating circumstances.
2. Statistical analysis courses covering the following topics: descriptive statistics, logic of hypothesis testing, elementary inferential statistics, confidence intervals, one-way analysis of variance, post hoc comparisons, a priori contrasts, within-subjects and between-subjects effects, two-way and higher-order designs, and interactions. For recent additions to these course options, check with the director of graduate studies for the department.
3. Determined in conjunction with program committee.

Additional Requirements

The master of science degree requires completion of a substantial research project. Department faculty members, in consultation with the student, determine the format for the presentation of the project, which will include an oral defense in combination with either a master's thesis, a journal-style manuscript, or a comprehensive project report. Required courses must be taken for letter grades and passed with grades of B– or better. Students must maintain at least a 3.00 grade point average for all courses. Additional university master's degree requirements are described under Master's Degrees in the **Graduate School** section of this catalog.

Doctor of Philosophy Degree Requirements

HPHY 611–613	Professional Skills I-III	3
HPHY 621–623	Systems Physiology I-III	12
HPHY 607	Seminar: [Topic] [1]	1-5
EDUC 614	Educational Statistics [2]	4
EDUC 640	Applied Statistical Design and Analysis [2]	4
Human physiology courses or other courses most appropriate to student's line of study [3]		4
Select one of the following:		4
HPHY 670	Advanced Respiratory Physiology	
HPHY 676	Human Cardiovascular Control	
HPHY 684	Kinematics of Human Movement	
HPHY 685	Kinetics of Human Movement	
HPHY 610	Experimental Course: [Topic]	
HPHY 603	Dissertation [4]	1-16
Total Credits		**33-52**

1. Must register for course every term of enrollment, with one term possibly waived by the director of graduate studies to accommodate the student's research activities or other extenuating circumstances.
2. Statistical analysis courses covering the following topics: descriptive statistics, logic of hypothesis testing, elementary inferential statistics, confidence intervals, one-way analysis of variance, post hoc comparisons, a priori contrasts, within-subjects and between-subjects effects, two-way and higher-order designs, and interactions. For recent additions to these course options, check with the director of graduate studies for the department.
3. Determined in conjunction with program committee.
4. Must register for course every term of enrollment after advancing to candidacy.

The doctoral degree requires completion of a minimum of 135 credits beyond the bachelor's degree; at least 60 of these credits must be completed through human physiology courses. Written and oral doctoral comprehensive examinations are taken after completing a substantial portion of the program of study. Upon passing these examinations, the student is advanced to candidacy. A final oral defense is held after completion of the dissertation and after all other degree requirements have been met. Required courses must be taken for letter grades and passed with grades of B– or better. Students must maintain at least a 3.00 grade point average for all courses. Additional university doctor of philosophy degree requirements are described under Doctoral Degrees in the **Graduate School** section of this catalog.

Admission Requirements

Applicants for the athletic training MS program should check the Graduate Studies in Athletic Training website (http://pages.uoregon.edu/uogradat) and applicants for the research-intensive MS-PhD program should check the department website (http://physiology.uoregon.edu) for information on the online graduate application and deadlines.

Recommended criteria for applying to all graduate programs include the following:

- Baccalaureate degree from an accredited university with a GPA of 3.40 or higher on a 4.00 scale
- GRE scores of 153 or higher on each of the verbal and quantitative sections (institution code: 4846; department code: 0217)

- Completed course work with a grade of B+ or higher in general chemistry, general biology, and two courses of physiology or combined anatomy and physiology
- International students who have not received a degree from a university in a country whose official language is English must have a TOEFL score of 575 (paper test), or 90 (Internet-based test) or an IELTS overall band score of 7.0.

Minimum requirements for admission to all graduate programs include the following:

- Baccalaureate degree from an accredited university with a GPA of 3.00 or higher on a 4.00 scale
- GRE scores of 148 or higher on each of the verbal and quantitative sections (institution code: 4846; department code: 0217)
- Completed course work with a grade of B– or higher in general chemistry, general biology, and two courses of physiology or combined anatomy and physiology
- International students who have not received a degree from a university in a country whose official language is English must have a TOEFL score of 575 (paper test), or 90 (Internet-based test) or an IELTS overall band score of 7.0