Physiology

Office: 5374 Scott Hall; 313-577-1520
Chairperson: Jian-Ping Jin
http://physiology.med.wayne.edu

Physiologists study the functions of living organisms, tissues and/or isolated cells. The emphasis in physiology is on the functional interrelationships between healthy, as opposed to diseased tissues, cells and sub-cellular components. Increasingly, the discipline focuses on the properties of single cells and their sub-cellular components with the availability and application of molecular biology techniques. However, whether at the level of the single cell or the whole organism, the aim of the physiologist is to understand complex functional interrelationships between body tissues.

Assistantships and Research
The Department has graduate assistantships and graduate research positions available for a limited number of qualified students. All doctoral students accepted into the program are considered for financial assistance and no application forms are necessary for this purpose. Students on assistantships typically take no more than ten credits in a given semester. Financial support for the training program in Physiology is derived from University fellowships, faculty grants, individual graduate fellowships, and limited cardiovascular traineeships supported by a training grant from the National Institute of Health-National Heart, Lung, and Blood Institute.

All students, whether or not they hold a fellowship or an assistantship, are required to assist the graduate faculty in research and teaching activities as a component of their educational experience.

CALA, STEVEN E.: Ph.D., Indiana School of Medicine; M.A., Texas A & M University; B.S., Purdue University; Associate Professor
CHEN, XUEQUN: Ph.D., University of Michigan; M.S., B.S., Nankai University; Assistant Professor
CHUNG, CHARLES S.: Ph.D., B.S., Washington University; Assistant Professor
DEGRACIA, DONALD J.: Ph.D., Wayne State University; B.S., Michigan Technological University; Professor
DICARLO, STEPHEN E.: Ph.D., M.S., University of Oklahoma; Professor
DUNBAR, JOSEPH C.: Ph.D., Wayne State University; M.S., Texas Southern University; B.S., Alcorn College; Professor
JENA, BHANU P.: Ph.D., Iowa State University; B.S., Utkal University; University Professor
MUELLER, PATRICK: Ph.D., St. Louis University; Associate Professor
O’LEARY, DONAL S.: Ph.D., University of Texas; B.A., Miami University; Professor
RAM, JEFFREY L.: Ph.D., California Institute of Technology; B.A., University of Pennsylvania; Professor
RILLEMA, JAMES A.: Ph.D., M.S., Michigan State University; B.S., Calvin College; Professor
SHISHEVA, ASSIA C.: Ph.D., B.S., Sofia University; Professor
SKAFAR, DEBRA F.: Ph.D., Vanderbilt University; B.S., Ohio University; Associate Professor
SUN, FEI: M.D., Nanjing Medical University; Ph.D., University of Alabama; Assistant Professor
WALZ, DANIEL A.: Ph.D., Wayne State University; M.S., St. Louis University; B.S., St. John Fisher College; Professor
YINGST, DOUGLAS ROY: Ph.D., University of Southern California, Los Angeles; B.A., McPherson College; Associate Professor

PREREQUISITE: BIO 3200 with a minimum grade of C-

Equivalent: BIO 5680

PSL 5010 Individual Research I Cr. 2-5
Direct participation in laboratory research in the physiological sciences under the supervision of a departmental faculty advisor. Introduction to experimental protocol and current related scientific literature. Offered every term.
Restriction(s): Enrollment limited to students with a class of Unranked Grad, Senior or Post Bachelor.
Repeatable for 5 Credits

PSL 5680 Basic Endocrinology Cr. 3
Basic description of the human endocrine system, the endocrine control of several physiologic processes (growth, development, metabolism and reproduction), and a description of common endocrine disorders. Offered fall.
Prerequisite: KIN 3570 with a minimum grade of C-
Restriction(s): Enrollment limited to students with a class of Unranked Undergrad, Freshman, Sophomore, Junior, Senior or Post Bachelor.
Equivalent: KIN 6310, PT 6310

PSL 6010 Physiology of Exercise II Cr. 3
Metabolic, neuromuscular, cardiovascular, and respiratory adjustments to acute and chronic exercise in health and disease, including body composition and weight control, nutritional considerations, and the effects of different environments on exercise performance. Offered fall.
Prerequisite: KIN 3570 with a minimum grade of C-
Restriction(s): Enrollment limited to students with a class of Unranked Undergrad, Freshman, Sophomore, Junior, Senior or Post Bachelor.
Equivalent: KIN 6310, PT 6310

PSL 6300 Biotechnology: Techniques and Applications Cr. 2
Various biotechnical methodologies currently used in research and industry; application of these methodologies in scientific inquiries. Offered fall.

PSL 6310 Biotechnology: Techniques and Applications Lab Cr. 2-5
Students choose one of the biotechnology techniques discussed in PSL 6300 and spend the semester in an active research laboratory learning the practice of the technique through hands-on experience. Offered winter.
Prerequisite: (May be taken concurrently: [PSL 6300 with a minimum grade of C])
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7010 Basic Graduate Physiology Lecture I Cr. 4
Introduction to basic human physiology. Offered fall.
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7011 Basic Integrative Graduate Physiology I Cr. 4
Offered fall.
Restriction(s): Enrollment is limited to Graduate level students.
PSL 7020 Basic Graduate Physiology Laboratory I Cr. 2
Introductory laboratory exercises to measure cell and membrane function; neuronal activity; electrophysiology; and hormonal actions. Offered Fall.
Restriction(s): Enrollment is limited to Graduate level students.
Course Material Fees: $50

PSL 7030 Basic Graduate Physiology Lecture II Cr. 4
Functional mechanisms of the human body. Offered Winter.
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7031 Basic Integrative Graduate Physiology II Cr. 4
Offered Winter.
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7040 Basic Graduate Physiology Laboratory II Cr. 2
Experimental physiology of organ systems. Offered Winter.
Restriction(s): Enrollment is limited to Graduate level students.
Course Material Fees: $50

PSL 7060 Current Literature in Physiology Cr. 1
Students are required to present published papers at least once each semester, and must attend all class meetings. Offered Yearly.
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7215 Nanobioscience Cr. 3
Introduction to interdisciplinary research field of nanobioscience, at the interphase of biology, chemistry, and physics; specific properties of nanoscale objects. Offered Winter.
Restriction(s): Enrollment is limited to Graduate level students.
Equivalent: PHY 7215

PSL 7400 Advanced Respiratory Physiology Cr. 2
Advanced topics in respiratory physiology; guidance in critical reading and discussion of the literature. Offered Biannually (Winter).
Restriction(s): Enrollment is limited to Graduate or Medical level students.

PSL 7550 Advanced Renal Physiology Cr. 2
A detailed study of the physiological mechanisms promoting homeostasis of the body fluid volumes and ionic composition in the mammal. Offered Biannually (Fall).
Prerequisites: (PSL 7030 with a minimum grade of C)
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7600 Advanced Cardiovascular Physiology Cr. 2
Basic principles of heart dynamics and control techniques in measurement of cardiac function. Offered Fall.
Prerequisites: (PSL 7030 with a minimum grade of C)
Restriction(s): Enrollment is limited to students with a major in Physiology; enrollment is limited to Graduate level students; enrollment limited to students in a Doctor of Philosophy or Master of Science degrees.

PSL 7610 Biological Basis of Sleep Cr. 2
Basic physiology of human sleep; role of sleep in cognitive and physical performance; sleep disorders (such as sleep apnea, narcolepsy). Offered Biannually (Winter).
Prerequisites: (PSL 7030 with a minimum grade of C)
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7640 Cell and Molecular Physiology Cr. 3
Lecture and discussion. Research in atomic force microscopy, molecular structure, exocytosis, insulin signal transduction, glucose transport, estrogen receptors, ion channels, Na, K-ATPase, Na/Ca exchanger, hormonal regulation of ion transport. Offered Biannually (Winter).
Prerequisites: (PSL 7010 with a minimum grade of C)
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7660 Neurophysiology Cr. 3
Anatomy and physiology of the neuron and the mammalian nervous system. Correlations of central nervous system functions and electrophysiology. Offered Biannually (Fall).
Prerequisites: (PSL 7010 with a minimum grade of C)
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7680 Endocrinology Cr. 4
A detailed emphasis on current research. Student participation encouraged; each student required to present a one hour lecture. Offered Winter.
Prerequisites: (PSL 7010 with a minimum grade of C)
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7690 Principles and Techniques of Reproductive Biology Cr. 3
Principles and techniques in reproduction including endocrinology, gametogenesis, fertilization, implantation, embryogenesis, stem cell determination, pregnancy and parturition. Offered Biannually (Fall).
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7700 Embryonic Stem Cell Biology Cr. 3
Methods involved in production and utilization of embryonic stem cells. Lectures supplemented with text, reviews, and recent papers. Offered Biannually (Winter).
Prerequisite: PSL 7690
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7710 Disease States and Reproductive Processes Cr. 1
Diseases and areas in reproductive medicine where additional research is required. Students accompany clinicians during rounds in hospital and out-patient clinics. Offered Spring/Summer.
Restriction(s): Enrollment is limited to students with a major in Medicine; enrollment is limited to Graduate level students.

PSL 7730 Reproductive Sciences: Teratology Cr. 3
Principles of the science of birth defects; focus on impact of environmental poisons, medicines, and drugs of abuse on developing germ cells, embryos and fetuses. Roles of pharmacological/toxicological, physiological (maternal, placental, and fetal), genetic and nutritional factors in the teratogenic response are examined. Texts and current readings. Offered Biannually (Fall).
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7775 Current Research Topics in Reproductive Science Cr. 1
Lectures covering current topics in reproductive biology, health, and medicine. Offered Fall.
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7825 Membrane Physiology: Protein Transport, Lipid Metabolism and Human Diseases Cr. 2
Covers the basic concepts of membrane transport in the mammalian secretory pathway with an emphasis on the dysregulation of key transport steps and the defective mutations of key regulators which lead to human diseases (e.g. neurodegenerative diseases, diabetes and coronary heart diseases). Offered Fall.
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7880 Special Problems in Physiology Cr. 1-8
Topics individually arranged with faculty. Offered Every Term.
Restriction(s): Enrollment is limited to Graduate level students.
Repeatable for 998.99 Credits

PSL 7890 Seminar Cr. 1
For graduate students in physiology. Participation in weekly departmental seminars. Offered Fall, Winter.
Restriction(s): Enrollment is limited to Graduate level students.
Repeatable for 6 Credits
PSL 7910 Molecular Male Reproduction and Chromatin Cr. 1
Students write topic-specific essays. Offered Fall.
Restriction(s): Enrollment is limited to Graduate level students.

PSL 7996 Arranged Research Cr. 1-15
Graduate level experiences in research techniques. Special research
topics in specified areas arranged with individual faculty member.
Offered Every Term.
Restriction(s): Enrollment is limited to Graduate level students.
Repeatable for 15 Credits

PSL 8996 Master's Thesis Research and Direction Cr. 1-8
Offered Every Term.
Restriction(s): Enrollment limited to students with a class of Candidate
Masters; enrollment is limited to Graduate level students.
Repeatable for 8 Credits

PSL 8999 Pre-Doctoral Candidacy Research Cr. 1-8
Research in preparation for doctoral dissertation. Offered Every Term.
Restriction(s): Enrollment is limited to Graduate level students.
Repeatable for 12 Credits

PSL 9991 Doctoral Candidate Status I: Dissertation Research and
Direction Cr. 7.5
Offered Every Term.
Restriction(s): Enrollment is limited to Graduate level students.

PSL 9992 Doctoral Candidate Status II: Dissertation Research and
Direction Cr. 7.5
Offered Every Term.
Prerequisite: PSL 9991 with a minimum grade of S
Restriction(s): Enrollment is limited to Graduate level students.

PSL 9993 Doctoral Candidate Status III: Dissertation Research and
Direction Cr. 7.5
Offered Every Term.
Prerequisite: PSL 9992 with a minimum grade of S
Restriction(s): Enrollment is limited to Graduate level students.

PSL 9994 Doctoral Candidate Status IV: Dissertation Research and
Direction Cr. 7.5
Offered Every Term.
Prerequisite: PSL 9993 with a minimum grade of S
Restriction(s): Enrollment is limited to Graduate level students.

PSL 9995 Candidate Maintenance Status: Doctoral Dissertation Research
and Direction Cr. 0
Offered Every Term.
Restriction(s): Enrollment is limited to Graduate level students.
Course Material Fees: $348.67
Repeatable for 0 Credits