Physiology and Biophysics (PHYB)

PHYB 502. Physiology of Reproduction. 2 hours.
The purpose of this course is to enable students to acquire a detailed and up-to-date understanding of the Biology of Reproduction at both the physiological and molecular levels.

PHYB 512. Gastrointestinal Physiology. 2 hours.
Advanced study of the physiology of the gastrointestinal tract. Special emphasis will be placed on recent developments in cellular and molecular aspects and on how they relate to established concepts in the literature. Course Information: Prerequisite(s): PHYB 402 or consent of the instructor.

PHYB 516. Physiology and Biochemistry of Muscle Contraction. 2 hours.
Structure and function of myosin, actin, tropomyosin, troponin, and the sarcoplasmic reticulum; control, energetics, and mechanism of muscle contraction; gene expression.

PHYB 518. Cardiovascular Pathophysiology. 3 hours.
Focuses on pathogenesis and fundamental mechanisms of impaired cardiac performance due to systemic and cardiac disease. Function and pathology of diseased heart in relation to normal healthy states and therapeutic interventions. Course Information: Prerequisite(s): GCLS 500 and either GCLS 501 or GCLS 502 or GCLS 503; or consent of the course coordinator.

PHYB 530. Stem Cells. 2 hours.
Discussion of stem cell development into different cell types that may offer a renewable source of replacement cells to treat diseases, conditions, and disabilities. Cells from adult tissue, fetal tissue, and embryonic sources are discussed. Course Information: Recommended background: Knowledge of cell biology.

PHYB 531. Metabolism: An Integrated Multi-Organ Crosstalk. 3 hours.
Mechanisms of tissue inflammation and repair in various tissues and different pathological conditions. This course will focus on current research related to factors influencing inflammation and tissue repair including the effects of exercise. Course Information: Previously listed as PHYB 523. Prerequisite(s): Consent of the instructor.

PHYB 540. Ion Channels: Structure, Function, Pharmacology and Pathology. 2 hours.
The concept of ion channels is treated from the perspectives of their molecular structures and functions. Modulation, pathological conditions (channelopathies), and pharmacological intervention will also be treated. Course Information: Same as PCOL 540. Recommended background: One undergraduate course in biochemistry and one in physiology, or consent of the instructor.

PHYB 551. Human Physiology I. 5 hours.
Lectures and conferences in human physiology. Emphasis is on cellular, nerve-muscle, cardiovascular, respiratory and renal physiology. Course Information: Prerequisite(s): Mathematics, undergraduate physics, and organic chemistry; or consent of instructor. Recommended background: Course work in biological sciences. Class Schedule Information: To be properly registered, students must enroll in one Conference and one Lecture.

PHYB 552. Human Physiology II. 5 hours.
Lectures and conferences in human physiology. Continuation of PHYB 551 Human Physiology II. Emphasis is on central nervous, endocrine and reproductive systems physiology. Course Information: Prerequisite(s): PHYB 551. Recommended background: Course work in biological sciences.

PHYB 561. Introduction to the Biopharmaceutical Industry, Including Leadership and Communication Skills. 4 hours.
Designed for the students to gain an understanding of the organization, operations, and business model, past, present and future of the biopharmaceutical industry, both large pharma, start-ups and those companies in between. Course Information: Prerequisite(s): Enrolled in the Master of Physiology for Therapeutic Development program or consent of the instructor. Recommended background: A Bachelor of Science degree in Biology or related field.

PHYB 562. Therapeutic Development – Clinical Trials. 3 hours.
Students will understand how clinical trials are designed and conducted during drug development. Topics will include clinical trial designs for phases 1-4, randomization principles and procedures, analysis of pharmacokinetic data for bioequivalence. Course Information: Prerequisite(s): Consent of the instructor. Recommended background: All students must have a Bachelor of Science in Biology or related field.

PHYB 563. Bioinformatics, Biostatistics and Epidemiology. 3 hours.
Provides students with the operational knowledge and vocabulary to facilitate discussions with others regarding these interdisciplinary subjects. Course Information: Prerequisite(s): Enrolled in the Master of Physiology for Therapeutic Development program or consent of the instructor. Recommended background: A Bachelor of Science degree in Biology or related field.

PHYB 564. Introduction to Regulatory and Medical Affairs with Peri/Post Approval Processes. 4 hours.
Designed for the students to gain an understanding of the various roles in regulatory affairs and FDA drug regulations. Course Information: Prerequisite(s): Enrolled in the Master of Physiology for Therapeutic Development program or consent of the instructor. Recommended background: A Bachelor of Science degree in Biology or related field.

PHYB 565. Seminar in Pharmaceutical Operations. 2 hours.
Students will gain operating knowledge of the workings of a pharmaceutical company. Topics will include career opportunities. Course Information: Prerequisite(s): Enrolled in the Master of Physiology for Therapeutic Development program or consent of the instructor. Recommended background: A Bachelor of Science degree in Biology or related field.

PHYB 569. Methods in Experimental Physiology. 3 hours.
Primarily for students in physiology. Registration limited to eight. A laboratory course designed to acquaint students with advanced techniques and methodology in physiologic investigations. Course Information: Prerequisite(s): Enrollment in the M.S. or Ph.D. in Physiology and Biophysics program, and credit or concurrent registration in PHYB 401 or the equivalent; or consent of the instructor.

PHYB 571. Clinical Applications of Physiology I. 2 hours.
Students in this course will apply principles of basic physiology to select topics in state of the art science affecting both clinical issues and research designed to address these issues. Course Information:.

PHYB 572. Clinical Applications of Physiology II. 2 hours.
Students in this course will apply principles of basic physiology to select topics in state of the art science affecting both clinical issues and research designed to address these issues. Course Information: Prerequisite(s): Mathematics, undergraduate physics, and organic chemistry; or consent of instructor. Recommended background: Extensive course work in undergraduate sciences, particularly biological sciences. Corequisites: Requires concurrent registration in PHYB 552.

PHYB 585. Cell Biology. 4 hours.
Functional and structural organization of the cell with emphasis on the cellular basis of physiological activity. Course Information: Same as ANAT 585 and MIM 585.

PHYB 586. Cell Physiology. 3 hours.
Advanced functional and structural organization of the cell with emphasis on the cellular basis of physiological activity. Course Information: Prerequisite(s): PHYB 552 and GCLS 501 and GCLS 503; or consent of the instructor.

PHYB 590. Seminar in Cardiovascular Science. 1 hour.
Weekly seminars on advanced cardiovascular science topics by staff and invited speakers. Course Information: Satisfactory/Unsatisactory grading only. Prerequisite(s): Consent from the course coordinator. Enrollment is open to students following completion of their first year of graduate studies.

PHYB 591. Departmental Seminar. 1 hour.
Weekly seminar by staff and invited speakers. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. Required of all physiology and biophysics students each fall and spring semester while enrolled in the graduate program. Prerequisite(s): Graduate or professional standing.

PHYB 592. Experimental and Diagnostic Methods in Cardiovascular Science. 3 hours.
Establishes the fundamental physical basis between diagnostic and experimental procedures in the clinic and basic science laboratory, combined with some direct observation of methods used for experimental approaches. Course Information: Prerequisite(s): GCLS 500 and either GCLS 501 or GCLS 502 or GCLS 503; or consent of the course coordinator.

PHYB 594. Special Topics in Physiology and Biophysics. 1-4 hours.
Topics may include bioengineering, endocrinology, membrane biology, ion transport and its regulation, muscle physiology, neurophysiology, molecular neurobiology and others of current significance in physiology and biophysics. Course Information: May be repeated. Students may register in more than one section per term. Prerequisite(s): Consent of the instructor.

PHYB 595. Journal Club and Seminar in Physiology. 1 hour.
Student presentation and discussion of assigned topics of current importance in physiology and biophysics as well as related fields. Course Information: Satisfactory/Unsatisfactory grading only. Prerequisite(s): Consent of the instructor. Limited to degree candidates in physiology and biophysics.

PHYB 596. Independent Study. 1-4 hours.
Individual study guided by a faculty member. The format of the course, examination and grading to be established by the faculty member. Course Information: May be repeated. Students may register in more than one section per term. Prerequisite(s): Consent of the instructor.

PHYB 598. M.S. Thesis Research. 0-16 hours.
Thesis work under the supervision of a graduate adviser. Course Information: Satisfactory/Unsatisfactory grading only. Prerequisite(s): Graduate standing in physiology and biophysics.

PHYB 599. Ph.D. Thesis Research. 0-16 hours.
Thesis work under the supervision of a graduate adviser. Course Information: Satisfactory/Unsatisfactory grading only.