

DOCTOR OF PHYSICAL THERAPY

Physical therapists (PTs) are healthcare professionals who diagnose and treat individuals of all ages, from newborns to the very oldest, who have medical problems or other health-related conditions, illnesses, or injuries that limit their ability to move and perform functional activities as well as they would like in their daily lives. Physical therapists examine each individual and develop a plan using treatment techniques to promote the ability to move, reduce pain, restore function, and prevent disability. In addition, PTs work with individuals to prevent the loss of mobility before it occurs by developing fitness and wellness-oriented programs for healthier and more active lifestyles.

Graduates of the D.P.T. program are eligible to take the National Physical Therapy Examination, given by The Federation of State Boards of Physical Therapy, and the Jurisprudence Exam, given by the Texas Board of Physical Therapy Examiners (<http://www.ptot.texas.gov/page/home>). A license to practice physical therapy in Texas is contingent on successful completion of these examinations. The D.P.T. program is accredited by the Commission on Accreditation in Physical Therapy (CAPTE), 1111 N. Fairfax Street, Alexandria, Virginia 22314.

Admission Requirements

Entry-Level Doctor of Physical Therapy

Applications for the Fall (July) entry-level DPT program are accepted beginning July 1 of the year prior to enrollment. The deadline for the regular Fall 2017 application cycle is October 2, 2017 and the early offer deadline is September 15, 2017. For the application cycle in the fall of 2018, please refer to the Physical Therapy Admission website (<http://www.uthsca.edu/academics/health-professions/doctor-physical-therapy-admissions>). Applicants are to submit their application for admission through the Physical Therapy Centralized Application Service (PTCAS) (<http://www.ptcas.org/home.aspx>) as well as complete the Physical Therapy Supplemental Application. See the PTCAS website (<http://www.ptcas.org/home.aspx>) for complete application instructions. A completed application, the application fee, supplemental application fee, official transcripts from each college or university attended, test scores and all other supporting documents must be submitted to PTCAS (<http://www.ptcas.org/home.aspx>) no later than above stated deadlines. It is the applicant's responsibility to verify that all documents have been received before the application deadline. No incomplete applications will be considered.

A baccalaureate degree is required for admission. A baccalaureate degree can be pending at the time of application, but must be earned prior to June 1 of the enrollment year. Note that program prerequisites can be in progress at the time of application but must be completed by June 1 of the enrollment year.

All applicants must complete the program prerequisites (47 semester credit hours) and fulfill the requirements below:

- Human Anatomy Lecture and Laboratory, 4 semester credit hours
- Human or Mammalian Physiology Lecture and Laboratory, 4 semester credit hours
- Biology 1 Lecture and Laboratory, 4 semester credit hours
- A second Biology Course that is not plant-based (Botany is not accepted) - Lecture and Laboratory, 4 semester credit hours

- Chemistry I Lecture and Laboratory, 4 semester credit hours
- Chemistry II or Organic Chemistry or Biochemistry - Lecture and Laboratory, 4 semester credit hours
- Physics I & II Lecture and Laboratory, 8 semester credit hours
- Intro to Psychology or General Psychology, 3 semester credit hours
- Developmental Psychology, Motor Development, or Human Development (must cover the lifespan), 3 semester credit hours
- Intro to Sociology, Social Psychology, or Cultural Anthropology, 3 semester credit hours
- Speech – Public Speaking, 3 semester credit hours
- Statistics (Math, Sociology, or Psychology), 3 semester credit hours
- *****NOTE: All science courses must be designated for Science majors or pre-allied health majors. Anatomy & Physiology I and II series for a total of 8 semester credit hours is accepted in lieu of separate anatomy and physiology courses.

ADDITIONAL REQUIREMENTS:

- Overall grade point average (GPA) of at least 3.2 on a 4.0 scale and Science/Math prerequisite GPA of at least 3.2 on a 4.0 scale
- Completion of a medical terminology course – this can be completed at a college or university or an online certification course.
- Official transcripts from each college and university currently or previously attended. Applicants who are enrolled in college courses at the time of application should submit an official transcript showing courses in progress. An updated transcript must be submitted upon completion of the courses. Note: Transfer credits indicated on another school's transcript are not accepted in lieu of submitting the original institution record for that coursework. Transcripts from institutions outside the United States must be submitted in the original language to a NACES Member evaluation agency for English translation and then must be submitted to PTCAS (<http://www.ptcas.org/home.aspx>) for full instructions.
- Completion of the PTCAS application and the Physical Therapy Supplemental Application.
- Payment of the non-refundable PTCAS application fee and Physical Therapy Supplemental Application fee.
- Submission in PTCAS of a minimum of 50 observation hours gained through volunteering or employment in a physical therapy setting with a licensed Physical Therapist that demonstrates knowledge and understanding of physical therapy.
- Two letters of reference (at least one letter from a licensed physical therapist) sent directly to PTCAS.
- Personal written statement addressing the applicant's goal of becoming a physical therapist in PTCAS.
- Personal résumé including previous work experience, honors and awards, extracurricular activities, and community service experience in PTCAS.
- Graduate Record Examination (GRE) scores must be submitted; used only for program development purposes, but not for making admissions decisions.
- Any additional materials required from PTCAS (see PTCAS website for instructions).
- **International Applicants only:** Submit *Test of English as a Foreign Language* (TOEFL) scores; minimum scores 560 (paper) or 68 (Internet).

Degree Requirements

The Doctor of Physical Therapy program (DPT) (<http://www.uthscsa.edu/shp/pt>) begins in the Fall (July) semester and consists of 100 semester credit hours of professional-level courses taken over 7 semesters (33 months). The program includes 30 weeks of full-time clinical affiliations and a 4-week specialty clinical internship.

Sample Plan of Study

First Year

Fall

		Credit Hours
PHYT 7001	Clinical Foundations 1	4
PHYT 7005	Exercise and Physiology of Rehabilitation	4
PHYT 7009	Neuroscience 1	3
PHYT 7014	Systematic Reasoning and Scientific Investigation 1	3
PHYT 7017	Cells, Systems, and Disease	3
PHYT 8022	Professional Issues and Clinical Decision-Making 1	2

Spring

CSBL 5022	Inter-professional Human Gross Anatomy	5.5
PHYT 7011	Clinical Foundations 2	4
PHYT 7012	Movement Science 1	4
PHYT 7019	Neuroscience 2	3
PHYT 8122	Professional Issues and Clinical Decision-Making 2	2

Second Year

Fall

PHYT 7018	Pharmacological Principles in Physical Therapy	2
PHYT 8002	Management of the Patient with Musculoskeletal Dysfunction 1	5
PHYT 8007	Orthotics in Rehabilitation	1.5
PHYT 8011	Therapeutic Approaches to Pain and Movement Dysfunction	3.0
PHYT 8108	Management of the Patient with Neuromuscular Dysfunction 1	5
PHYT 8130	Movement Science 2	2

Spring

PHYT 8014	Seminar in Physical Therapy Patient Care	1
PHYT 8012	Prosthetics in Rehabilitation	1.5
PHYT 8013	Management of the Patient With Cardiopulmonary Dysfunction	3
PHYT 8114	Management of the Patient with Musculoskeletal Dysfunction 2	5
PHYT 8116	Management of the Patient with Neuromuscular Dysfunction 2	5
PHYT 8222	Professional Issues and Clinical Decision-Making 3	1

Summer

PHYT 7021	Clinical Experience 1	5
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Third Year

Fall

PHYT 8021	Clinical Experience 2	5
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PHYT 8121	Clinical Experience 3	5
Spring		
PHYT 8075	Human Development across the Lifespan	3
PHYT 8102	Systematic Reasoning and Scientific Investigation 2	2
PHYT 8106	Principles of Administration in Physical Therapy	2
PHYT 8112	Management of the Complex Patient	3.5
PHYT 8221	Clinical Internship	2
Total Credit Hours:		100.0

Objectives/Program Outcomes

Upon completion of the Doctor of Physical Therapy program, the student will demonstrate the attitudes, knowledge and skills necessary for competent practice. The graduating student:

- will demonstrate the skills necessary for entry-level practice of physical therapy.
- is an advocate for service to the community and the profession.
- will develop critical inquiry skills related to clinical practice and research.
- will develop the skills necessary for lifelong learning.
- perform evidence-informed PT practice based on foundational knowledge and professional clinical skills.
- implement principles of ethical and professional behavior in PT practice.
- is to be an advocate for health and wellness at the individual and societal levels, demonstrate respect for self and others, and a commitment to the professional of physical therapy.
- interact in a professional manner that demonstrates effective communication for various audiences & purposes.
- develop skill of autonomy with ability to self-correct & provide critical feedback to peers.

Program Policies and Information

Advancement, Probation and Dismissal

Continuation as a Physical Therapy student is dependent on maintenance of a minimum cumulative grade point average of **3.0 (B)** while enrolled in the program. A student whose **cumulative** grade point average falls below **3.0** will be subject to academic probation. While on probation, a student must maintain a **B** average in those courses for which he or she is registered or be considered for dismissal. A student who receives a grade of **D** or **F** in any semester may also be subject to dismissal.

The Department of Physical Therapy Student Progress Committee (SPC) may recommend dismissal, probation, repetition of the course when next offered, repetition of the year, or other actions as deemed appropriate. The student who has been dismissed may be readmitted for further study by petition from the SPC. The request will be approved or disapproved by the Dean. Under no circumstances will a student on probation be awarded a degree.

Attendance for Academic Courses

It is expected that students will attend all scheduled classes, laboratories, and clinical sessions. Excused absences may be granted in such cases as illness or personal emergency. With verification of an excused absence, required work that has been missed can be submitted. It is

the responsibility of the student to notify the department if any absence occurs and to arrange with the faculty to make up work that is missed.

Dropping Courses

It is mandatory that the students adhere to the sequence of courses in the curriculum. Each course in the curriculum is built upon and is dependent upon a foundation established in a prior course. To drop a course, a student must seek permission from the course instructor and the Department Chair.

Grades in Clinical Courses

All clinical courses (i.e.: Clinical I, Clinical II, Clinical III, and Clinical Internship I) are graded **S** (Satisfactory) or **U** (Unsatisfactory). Clinical grades are not used in calculating the grade point average.

A grade of **S** is assigned if the student successfully satisfies the criteria for clinical courses. Failure to successfully satisfy the course criteria may result in one of the following grades:

- **I** (Incomplete) – Student performance is satisfactory on completed skills but below the minimum number required due to exceptional circumstances beyond student and/or clinic control.
- **U** (Unsatisfactory) – Student performance is below minimum requirement due to skill deficiency not related to exceptional circumstances or if the clinical is discontinued. A grade of **U** may also be assigned if the student demonstrates inappropriate behavior in the areas of professionalism or interpersonal skills. A grade of **U** may result in dismissal from the program.

Criteria and time frame for removal of **I** or **U** grades in clinical courses are determined based on clinical documentation and consultation with the clinical supervisor/clinical instructor. An **I** or **U** grade may require that the student complete an additional clinical affiliation or other remediation that could extend the professional curriculum beyond the expected graduation date. More than one **U** grade is not allowed within the total clinical course sequence.

Program Costs

In addition to required tuition and fees, there are costs for textbooks, scrubs, and equipment. The full-time clinical fieldwork experiences included in the curriculum may require that students locate outside of San Antonio for the duration of the rotations. Fieldwork expenses will vary according to individual arrangements depending on the cost of travel, temporary housing, maintenance of local accommodations, etc. Students are encouraged to budget for major expenditures that could be associated with these assignments. Detailed information about program costs can be found on the Department of Physical Therapy website.

CSBL Courses

CSBL 3005. Advanced Anatomy. Credit Hours.

Selected students will participate in lectures, detailed dissections, presentations, and teaching of Pre-Matriculation students in the gross anatomy laboratory. A special project or readings in the surgical anatomy literature will be assigned. This elective is considered to be a full-time commitment (40 hours per week). Students are expected to 1) attend all lectures given in the Pre-Matriculation program, 2) to teach in all scheduled laboratory sessions, 3) to prepare and present prosections, 4) to help prepare a laboratory examination, 5) to write and present a literature review on an original topic of interest to the student related to the region of the body being studied.

CSBL 4000. Special Topic. 4 Credit Hours.

This is a self-designed course created by both the student and the department to cover a specific topic. A Course Approval Form must be completed along with documentation of the designed course description.

CSBL 4001. Anatomy of the Newborn. 4 Credit Hours.

Detailed gross dissection and study of newborn specimen with special emphasis on developmental origins as well as features and relationships differing from the adult; combined with library study of developmental malformations. Course fees: Lab fee \$30.

CSBL 4002. Regional Anatomy. 4 Credit Hours.

Anatomy associated with one of the usual medical or surgical specialties, such as gastroenterology, neurology, orthopedics, obstetrics and gynecology, etc. Activities include detailed dissection, presentation of dissected material, assigned readings, and individual project. Course fees: Lab fee \$ 30.

CSBL 4004. Selected Research Project. 4 Credit Hours.

Individual research projects to be arranged between the student and faculty members with whom he/she wishes to work.

CSBL 4005. Advanced Anatomy. 4 Credit Hours.

Selected students are required to participate in lectures, detailed dissections, presentations of prosected material, and teaching in the first year medical gross anatomy laboratory. Special projects, activities, and assigned readings in the surgical anatomy and history of anatomy literature. Course fees: Lab fee \$30.

CSBL 4017. Advanced Neuroanatomy. 4 Credit Hours.

Selected students will be assigned a special project and readings in the neuro anatomical literature. Course Fees: Lab fee \$30.

CSBL 4024. History of Anatomy In Situ: Reawakening & Development of Anatomy in the 14th - 18th Century Italy. 4 Credit Hours.

An in-depth study of the awakening and development of anatomy in 14th - 18th century Italy, visiting the sites where this occurred in Padua, Bologna, and Florence. The course consists of one week of didactic lectures and discussion prior to two weeks in Italy visiting anatomical museums and two of the oldest universities in the world, and ending with a week of student presentations based on a paper focusing on a historical, social, or scientific issue arising during this period in the Italian medical schools and currently relevant to the students' chosen field of medicine.

CSBL 4025. Anatomy Mentored Teaching. 4 Credit Hours.

The Mentored Teaching Elective allows 3rd and 4th year medical students to serve as teaching assistants for the spring CSBL 5022 Inter-professional Human Gross Anatomy course. CSBL 5022 serves students in the occupational therapy, physical therapy, physician assistant and biomedical engineering programs, and students in the Masters of Anatomy graduate program. Teaching assistants will serve as instructors for laboratory dissections which cover the central and peripheral nervous systems, vertebral column and back, the upper and lower limbs, head and neck, body wall, thorax, abdomen, pelvis, and perineum. Other teaching assistant duties include preparation of prosection specimens for teaching and demonstration, lab practical exam setup and grading, and preparation and presentation of a brief topical review relevant to anatomy. Applicants should have attained a minimum grade of B in Language of Medicine and in Musculoskeletal/Dermatology and exhibit the highest standards of professionalism. Enrollment is by permission of the Undergraduate Medical Education Office and by the course directors.

CSBL 5007. Methods In Cell Biology. 1 Credit Hour.

Through a combination of lectures and demonstrations, the instructors will introduce students to techniques which are currently being used in cellular biology laboratories. The emphasis will be on the applications themselves, their uses, limitations, and the necessary controls. The following topic areas will be covered: imaging and microscopy, immunological techniques, bioinformatics (DNA and protein), rodent anatomy and histology, cytogenetics, and in vitro cell growth and transfection.

CSBL 5012. Physician Assistant Gross Anatomy. 5 Credit Hours.

This course will cover the basic principles of human anatomy. Lectures are correlated with laboratory sessions in which students will learn human gross anatomy of the adult through the study of cadaver prosections, bones, models, atlas drawings and radiographs. Emphasis will be placed on basic systems anatomy as they apply to the physician's assistant. Course Fees: Gross Anatomy fee \$30.00.

CSBL 5013. Gross Anatomy. 6 Credit Hours.

This course will teach structural and functional anatomy of the normal human body. Lectures will serve as introductory information for the laboratory dissections to follow and to clarify the interactions of the various anatomical components to accomplish the function of the body. The course will cover the central and peripheral nervous systems, vertebral column and back, head and neck, body wall, thorax, abdomen, pelvis, and perineum, and the upper and lower limbs. Special emphasis will be placed on the laboratory experience in which the learner will perform a detailed dissection of the entire human body in order to achieve an understanding of the three-dimensional relationships and thus the interactive function of the body. These dissections will be supplemented by the study of prosected specimens, models skeletons, and other demonstration materials. Course fees: Lab fee \$30 Human Materials fee \$865.

CSBL 5015. History Of Anatomy. 2.5 Credit Hours.

The history of anatomy course is designed to acquaint medical, dental, and graduate students with the history of medicine and especially with the physicians and scientists who made essential discoveries in human anatomy. Using a biographical approach, the course is presented as a seminar with lectures, assigned readings and student presentations.

CSBL 5016. Dental Gross Anatomy. 6 Credit Hours.

The focus of this course is the structure of the human body, with emphasis on the functional anatomy of the trunk, neck, head, and nervous system. Regional dissection of a human cadaver, by groups of students, is supplemented by individual study of prosections, models, skeletons, and other demonstration materials and is guided by lectures, conferences, and films. The first part of the course, which deals with the anatomy of the thorax and abdomen, presents a general overview of the functional architecture of most major body systems. The emphasis is on principles of structure, to allow development of a holistic understanding of human biology, both normal and pathological. The latter half of the course is devoted to study of the head and neck; greater emphasis will be placed on anatomical relationships with obvious reference to clinical dentistry. Course Fees: Human materials fee: \$865 Lab fee: \$30.

CSBL 5019. Gross Human Anatomy For Graduate Students. 6 Credit Hours.

This course will teach structural and functional anatomy of the normal human body. Lectures will serve as introductory information for the laboratory dissections to follow and to clarify the interactions of the various anatomical components to accomplish the function of the body. The course will cover the central and peripheral nervous systems, vertebral column and back, head and neck, body wall, thorax, abdomen, pelvis and perineum, and the upper and lower limbs. Special emphasis will be placed on the laboratory experience in which the learner will perform a detailed dissection of the entire human body in order to achieve an understanding of the three-dimensional relationships and thus the interactive function of the body. These dissections will be supplemented by the study of prosected specimens, models skeletons, and other demonstration materials. Permission of course director if required to enroll. Course fees: Human materials fee \$ 865 Lab fee \$30.

CSBL 5020. Dental Neuroscience. 1.5 Credit Hour.

This course will present the student with the basics of neuroanatomy underlying somatosensory perception, special senses, orofacial reflexes, and common neurological disorders. The emphasis will be on neuroanatomical pathways relevant to the head and neck, especially those mediated by the trigeminal system. The course also will include consideration of motor pathways and the special senses, disorders of which will necessarily influence treatment plans developed by future dental practitioners. Acquisition of a basic understanding of the neuroanatomical pathways discussed in lectures will be reinforced by laboratory sessions with representative images of brain and spinal cord sections.

CSBL 5022. Inter-professional Human Gross Anatomy. 5.5 Credit Hours.

This courses will teach structural and functional anatomy of the normal human body. Lectures will serve as introductory information for the laboratory dissections to follow and to clarify the interactions of the various anatomical components to accomplish the function of the body. The course will cover the central and peripheral nervous systems, vertebral column and back, the upper and lower limbs, head and neck, body wall, thorax, abdomen, pelvis, and perineum. Special emphasis will be placed on the laboratory experience in which the learner will perform a detailed dissection of the entire human body in order to achieve an understanding of the three-dimensional relationships and thus the interactive function of the body. The dissections will allow the student to understand the anatomical basis for disease and dysfunction in organ systems and their applications to clinical practice. They will be supplemented by the study of prosected specimens where possible, models skeletons, and other demonstration materials.

CSBL 5023. Development. 1 Credit Hour.

The course provides a survey of concepts in developmental biology (induction, cell-cell interactions, morphogen gradients, morphogenetic movements, transcription regulation, organogenesis) using experimental examples from both invertebrate and vertebrate embryos. The first set of lectures will focus on gametogenesis, fertilization, and early developmental events, such as cleavage, midblastula transition, gastrulation, and axis formation. The second set of lectures will explore the fates of germ layers in the contexts of cell type-specific differentiation and cell-cell interactions during organogenesis.

CSBL 5024. Genomics. 1 Credit Hour.

This course covers historical aspects of the Genomic project and high throughput methods (microarray, SAGE, proteomics, etc.) to perform global analysis of gene expression; the course also provides an overview of new biological fields such as systems biology, functional genomics, and comparative genomics. The students will have the opportunity to become familiarized with tools, methods, databases, and approaches used to extract biological information from global analyses. Hands-on training on biological databases and classes covering examples of the use of genomics to answer questions related to cancer and diseases is an important part of the course, helping the students to visualize how genomics can be used in their own research projects.

CSBL 5025. Genetics. 1 Credit Hour.

This course is designed to provide an overview of genetic research. Topics to be covered include: cytogenetics, mitochondrial genetics, cancer genetics, linkage analysis, complex traits, population genetics, animal models, sex determination, and epigenetics.

CSBL 5026. Stem Cell Biology. 1 Credit Hour.

This course is an up-to-date overview on current topics in stem cell biology. It is intended for the (future) basic scientist who is interested in studying the regulatory mechanisms of stem cells as well as for the (future) clinician who is interested in how stem cell biology will continue to impact patient care. Topics that will be discussed are: (1) basic biology and stem cells, including embryonic stem cells, adult stem cells, stem cells in different tissues and model systems; (2) microenvironment-mediated; (3) epigenetic regulators of stem cells; (4) stem cells in medicine, including regenerative medicine, cancer and aging; and (5) ethics.

CSBL 5030. Basic Histology. 1 Credit Hour.

This course is designed to provide students in the Anatomical Sciences track of the M.S. degree program an introduction to microscopic cell structures and relevant functions followed by study of the four basic human tissues (epithelial, connective, muscle and nervous tissues). In addition, a few specialized tissues (blood cells, bone, cartilage and lymphoid tissues) will be examined in depth to develop skill in understanding function in relation to viewing microscopic anatomical features. Overall, this course is meant to provide a foundation for the understanding of the microscopic architecture of the organ systems of the body and the role these play in normal activity and disease processes. Lectures, independent study (self-directed learning), and laboratory experiences will be used in teaching the fundamentals of human histology.

CSBL 5032. Dental Histology. 5 Credit Hours.

Through lectures, demonstrations, and laboratory work, students in this course will be given the opportunity to study the microscopic structure of the basic tissues and organs of the human body, followed by details of the embryologic development and microscopic structure of the various organs of the oral cavity. Current concepts in cellular biology are presented during the portion of the course in which they are most relevant. The general purpose of this course is to give students the opportunity to become acquainted with the basic embryology, cytology, and histology of normal human tissues and organs, thereby providing a foundation of knowledge for the understanding of normal activity and disease processes. Course Fees: Included in general lab fee. \$48 microscope fee for the Freshman year includes this course.

CSBL 5033. Brain Health Journal Club. 1 Credit Hour.

A journal club with an emphasis on brain health. The scope of the journal club is broad, with topics ranging from molecular mechanisms to the impact of injuries on behavior. Brain injuries ranging from stroke, spinal cord injury and traumatic brain injury (TBI) to age-associated neurodegeneration will be emphasized. Scientific articles on relevant or state-of-the-art techniques will also be encouraged. On a rotating basis, participants will be expected to present to the group either a paper of interest and relevance to their work or an update on their ongoing research or some combination of the two. PowerPoint slides are discouraged in favor of a chalk talk when presenting to the group.

CSBL 5060. Advanced Histology. 2 Credit Hours.

This course, designed for students enrolled in the Anatomical Sciences track of the MS degree program in Cell Systems & Anatomy, will examine the microscopic architecture of organs and their higher level organization into systems performing specific functions. Topics covered will include the integumentary, cardiovascular, respiratory, gastrointestinal, endocrine, urinary and male and female reproductive systems. The goal of this course is to enable students acquire knowledge of normal histological structure of organs and organ systems using light and electron microscopy, thereby providing a strong basis for the sound understanding of cell and tissue morphology in health and disease. The course will include lecture, laboratory and self-directed student learning. A prerequisite for this course is Basic Histology.

CSBL 5074. Introduction to Research. 0.5 Credit Hours.

This course is required of all MS students in the Anatomy Track in Cellular & Structural Biology and is available to the Biotechnology Track students. Students will have the opportunity to learn about the research interests of faculty in the program. This course will introduce students to the research strategies and help them identify a mentor and committee members.

CSBL 5077. Scientific Writing. 2 Credit Hours.

This course will provide students with the opportunity to develop skills in scientific writing and the presentation of research results. It will emphasize learning-by-doing-and-re-doing. Students will be required to write something every week. The capstone project for students will be to write a grant proposal and defend it in front of the class. One hour per week will be devoted to lecture and critique of published work; the other hour will consist of critique and revision of student writing by other students, as well as by the course director. Topics to be covered include: (1) fundamentals of writing clearly, (2) principles of revision, (3) effective presentation of data, (4) fundamentals of oral presentation, (5) writing/presenting to the appropriate audience, (6) how to write background/introductory sections, (7) how to write materials and methods, (8) how to write the discussion section, and (9) how to constructively critique one's own and others writing.

CSBL 5083. Practical Optical Microscopy. 1 Credit Hour.

This course will be a one-hour elective for graduate students consisting of eight (8) one-hour lectures plus eight (8) one-hour laboratories. The course focuses on the practical aspects of using optical microscopes. The objectives are to teach students the fundamental principles of optical microscopy and to provide them with hands-on experience using the optical instrumentation in the Institutional Imaging Core.

CSBL 5089. Graduate Colloquium. 2 Credit Hours.

This course is designed to provide graduate students with training in evaluating the scientific literature and in presentation of research in a seminar or journal club format. The course will focus on critical thinking, including evaluation of existing literature, interpretation of experimental results, and comparison of alternative models and interpretations. These tools are essential both for oral presentations and for writing grant proposals and manuscripts. Emphasis will be placed on evaluation of the science, organization of the manuscript, and on oral presentation skills.

CSBL 5091. Special Topics. 1-9 Credit Hours.

No description available.

CSBL 5095. Experimental Design And Data Analysis. 3 Credit Hours.

The purpose of the course is to provide an introduction to experimental design and statistical analysis. The emphasis of the course will be on the selection and application of proper tests of statistical significance. Practical experience will be provided in the use of both parametric and nonparametric methods of statistical evaluation. Among the topics to be covered are: data reduction, types of distributions, hypothesis testing, scales of measurement, chi square analysis, the special case of the comparison of two groups; analysis of variance; a posteriori multiple comparisons tests, tests of the assumptions of parametric analyses, advanced forms of the analysis of variance, linear regression, and correlation analysis. This course involves the use of statistical software; therefore, access to a laptop or a computer with web access for classes and examinations is required.

CSBL 6015. Selective Topics In Oncology: Gynecological Cancers. 2 Credit Hours.

This advanced elective course for the Cancer Biology Track provides a unique learning experience intended to prepare students in the emerging research areas of gynecological cancers for designing research experiments using pre-clinical and clinical research materials. The entire course comprises a small-group format in which students interact closely with a group of faculty who has active research or clinical programs focusing on molecular, clinical, and therapeutic areas of gynecological cancers.

CSBL 6021. Animal Models. 3 Credit Hours.

The relevant biology, applicability, and practical use of a number of animal models to biomedical research is covered. Invertebrate (e.g., *C. elegans*) and vertebrate (e.g., fish and rodents) model systems are included in the course. Strengths and weaknesses of each organism that render them particularly valuable as animal models are emphasized. Experimental approaches and tools that are utilized in conjunction with each animal model are rigorously examined. The course is taught from primary scientific literature using classic historical publications and recent publications.

CSBL 6040. Gross Anatomy Mentored Teach. 1 Credit Hour.

The Gross Anatomy Mentored Teaching Elective allow students in the Integrated Biomedical Sciences Program, School of Health Professions, and other qualified students to serve as preceptors for the spring CSBL 5022 Interprofessional Human Gross Anatomy course. CSBL 5022 serves students in the occupational therapy, physical therapy, physician assistant and biomedical engineering programs, and students in the Masters of Anatomy graduate program. Preceptors will serve as instructors for laboratory dissections which cover the central and peripheral nervous systems, vertebral column and back, the upper and lower limbs, head and neck, body wall, thorax, abdomen, pelvis, and perineum. Other preceptor duties include preparation of prosection specimens for teaching and demonstration, lab practical exam setup and grading, and preparation and presentation of a brief topical review relevant to anatomy. Students enrolling in this elective must have taken an approved human gross anatomy course (as determined and agreed upon by the course directors) with a minimum final grade of B within the previous five years.

CSBL 6048. Biology of Aging. 4 Credit Hours.

Biology of Aging is the core course of the Biology of Aging Track. The course consists of two modules: Aging and Longevity Mechanisms and Molecular and Cellular Mechanisms of Aging. The purpose of this course is to provide students with the most up-to-date information on the current understanding of the aging process. This advanced interdisciplinary graduate course provides experimental understanding of the interrelated areas of aging and age-related diseases. Faculty from several departments will be involved in teaching this course, which will cover the molecular and cell biology of aging, model systems used for aging studies, age-related changes in organs and tissues, and age-related diseases.

CSBL 6049. Cellular and Molecular Mechanisms of Aging. 2 Credit Hours.

This course provides up-to-date information on the current understanding of cellular and molecular mechanisms that contribute to aging. The focus is on investigation of specific mechanisms of aging including oxidative stress, nutrient sensing signaling pathways, stem cells and senescence, and genome stability. Experimental design and analysis, including pros and cons of approaches used to gain knowledge and how to appropriately interpret data, will be discussed throughout the course. The relationship between age-related changes in function and potential contributions age associated diseases will be examined via recently published research.

CSBL 6050. Aging and Longevity Mechanisms. 2 Credit Hours.

This module will focus on and evaluate several approaches used to modulate longevity and how these are used to discover the genetic, physiological and intracellular foundation of aging processes. The course will consist of interactive lectures complemented by guided reading of currently research papers. Students will be taught to hone critical reading skills and develop testable hypotheses to carry research forward. Topics will include: Genetics of Aging, Exceptional Longevity, Pharmacological Interventions, Calorie Restriction, Healthspan and Pathology of Aging.

CSBL 6058. Neurobiology Of Aging. 2 Credit Hours.

The nervous systems of many species, including humans, show obvious declines in function as a result of increasing age. In addition to the gradual decline observed in neural function, it is clear that increasing age also results in increased susceptibility of the nervous system to degenerative diseases such as Alzheimer's Disease, Parkinson's Disease, and Amyotrophic Lateral Sclerosis. This course will focus on recent findings and topics related to the underlying pathology of aging in the nervous system and the relationship of aging to neurodegenerative disease.

CSBL 6059. Stem Cells & Regenerative Medicine. 1 Credit Hour.

The fields of stem cells and regenerative medicine are rapidly evolving and have great potential to change the way medicine is practiced. This course will encompass topics from basics of tissue specific stem cell biology to pre-clinical animal models, strategies and progress in regenerative medicine. We will discuss some of the most current research being done in regenerative medicine from stem cell transplantation to biomaterials. Prerequisite: INTD 5000.

CSBL 6060. Anatomical Sciences Thesis. 1-8 Credit Hours.

Designed as an alternative to a "bench research"- based thesis, this longitudinal course for the Anatomical Sciences track in the Masters Program will culminate in the production of a thesis ideally suitable for adaptation as a scholarly publication in a peer-reviewed journal. The thesis should focus on assessment of an unanswered and important question on a relevant and approved subject, involve in-depth research and demonstrate critical thinking on the part of the student. A student in the Anatomical Sciences Track will meet with the Course Director during the spring semester of his/her first year in the program to begin to identify a research area and specific topic(s) for his/her thesis proposal. Areas of focus include (but are not limited to) the following: 1) Clinical Anatomy - anatomy related to medical procedures and/or training of health professionals; 2) Anatomical Variations - comparative research utilizing human cadavers in the gross anatomy laboratories or comparative research in animal models; 3) Anatomical Sciences Education - education research on anatomy teaching methods and approaches to teaching anatomy to health professions students; 4) History of Anatomy - research on the development of human anatomical studies, comparative anatomy concepts, anatomy education, or involving other applications of the humanities to anatomical sciences (e.g. medical illustration, literature, music); 5) Human and rodent micro-anatomy /histology; or 6) Anatomical aspects of a biomedical research endeavor.

CSBL 6064. Genes & Development. 4 Credit Hours.

Genes and Development is the core course of the Genetics, Genomics, and Development Track. The course consists of four modules: genetics, genomics, developmental biology, and stem cell biology. Basic concepts in genetics such as cytogenetics, mitochondrial genetics, cancer genetics, linkage analysis, complex traits, population genetics, animal models, sex determination, and epigenetics will be presented. The genomics section will include historical aspects of the genome project and high throughput analysis. The students are introduced to new techniques in global analysis as well as have hands-on experience. The developmental biology section provides a survey of concepts in developmental biology (induction, cell-cell interactions, morphogen gradients, morphogenetic movements, transcriptional regulation, organogenesis) using experimental examples from both invertebrate and vertebrate embryos. The stem cell biology section includes the following topics: basic biology of stem cells, including embryonic stem cells, adult stem cells, stem cells in different tissues and model systems; microenvironment-mediated and epigenetic regulators of stem cells; stem cells in medicine, including regenerative medicine, cancer, and aging; and ethics. Required for the Genetics, Genomics & Development Track.

CSBL 6068. Cancer Biology Core 1; An Introductory course. 1 Credit Hour.

This course introduces the key features of cancer biology. In particular this course will provide initial insight into the clinical presentation and the cellular processes involved in cancer biology. In addition will be an initial presentation of molecular oncology. Topics examined include oncogenes, tumor suppressor genes, apoptosis, control of cell cycle regulation, and control of cellular growth and proliferation. Required for Cancer Biology Discipline. Prerequisites: INTD 5007 (or INTD 6007 and INTD 6009).

CSBL 6069. Cancer Biology Core 2; Advanced Cancer Biology. 2.5 Credit Hours.

This course is designed to provide a detailed representation of cancer biology, from progression, standard of care and molecular alterations that drive recent diagnoses and therapeutic strategies. In addition, this course will offer an overview on special populations affected by cancers and models used in the investigation of cancer. Included are basic experimental methods, mouse models, ex vivo systems, molecular profiling and clinical trials. The conceptual notions on clinical trials of cancer drugs and the process of development of novel therapeutic drugs in cancer will be discussed. Required for Cancer Biology Discipline. Prerequisites: INTD 5007 (or INTD 6007 and INTD 6009) and CSBL 6068.

CSBL 6070. Cancer Biology Preceptorial. 0.5 Credit Hours.

This is a discussion-based course to help unify our cancer biology students. The idea is to work in a small team based manner for students to disseminate knowledge that they are obtaining by participating in advanced courses of different topics by presenting the topic, methods and relevance to cancer biology to their peers. The intent is that participating students will discuss the topic in detail to understand how it might be useful to cancer biology research, in effect an active learning process. The goal is to provide an integrated multidisciplinary view on cancer research. Prerequisites: CSBL 6068 and CSBL 6069.

CSBL 6071. Supervised Teaching. 1-12 Credit Hours.

This course consists of participation in the teaching program of the first-year medical, dental, or health professions curriculum. Semester hours vary depending on the time spent in teaching.

CSBL 6072. Presentation Skills. 0.5 Credit Hours.

This course is designed to provide graduate students in the CSB masters program the opportunity to develop their skills in oral presentation. The course will focus on critical thinking, clear and concise presentation of research endeavors, and communicating science to the public, to students, and to other scientists. The course will meet for 1 hour every other week and is intended for MS students in their second year of study. Part I (Fall Semester) will focus on general scientific presentation skills.

CSBL 6073. Selective Topics In Oncology: Gynecological Cancers. 2 Credit Hours.

This is an advanced elective course for the Cancer Biology Track. The course is a unique learning experience in preparing students in the emerging research areas of gynecological cancers for designing research experiments using preclinical and clinical research materials. The entire course is a small-group format in which student interact closely with a group of faculty who have active research or clinical programs focusing on molecular, clinical, and therapeutic areas of gynecological cancers.

CSBL 6074. Molecular Aspects Of Epigenetics. 2 Credit Hours.

The purpose of this course is to develop an understanding of the molecular aspects of epigenetics. This advanced course will be a unique learning experience that prepares the student to evaluate and design new research in the areas of epigenetic processes including imprinting, gene silencing, X chromosome inactivation, position effect, reprogramming, and the process of tumorigenesis. This module concerns epigenetic mechanisms. Topics include: DNA methylation, histone modifications, epigenetics and stem cells, cancer epigenetics, RNA interference and epigenetics, bioinformatics and epigenetics, and translational epigenetics. This course will include a didactic program and student discussion. For the student discussion module, faculty and students will jointly discuss key publications that serve to bridge the gap between the student's prior understanding of the field and the state of the art in that area.

CSBL 6075. Cancer Biology Enrichments Course. 0.5 Credit Hours.

This course is a series of enrichment presentations to the students, either in lecture format, visit to labs or attendance of a conference. The goal is to give secondary reinforcements of the didactic components of the core courses on cancer biology. Required for Cancer Biology Discipline.

CSBL 6090. Seminar. 1-9 Credit Hours.

Attendance and participation in the regularly scheduled department seminar series is required each semester the course is offered. The activities included in the seminar course are attendance at invited seminars, journal club, and the student presentations including student annual progress and final dissertation and thesis presentations.

CSBL 6094. Advanced Neuroanatomy. 0.5 Credit Hours.

This course in neuroanatomy is offered to graduate students seeking to advance their knowledge beyond the fundamental level. The course consists of reading from more advanced texts and current anatomical literature as well as dissection of deep white matter tracts within the cortex. The student must also complete a 20-page paper on a neuroanatomical topic.

CSBL 6095. Functional Genomic Data Analysis. 2 Credit Hours.

This course covers basics of genomic data analysis. Focus is on general computational methods, their biomedical basis, and how to evaluate analysis results. Qualitative algorithm descriptions are expected. Prerequisites: CSBL 5095 or Equivalent.

CSBL 6097. Research. 1-12 Credit Hours.

This course consists of independent, original research under the direction of a faculty advisor.

CSBL 6098. Thesis. 1-12 Credit Hours.

This course consists of instruction in the preparation of the thesis. Registration for at least one term is required of M.S. candidates. Admission to candidacy for Master of Science degree is required.

CSBL 6165. Medical Genetics. 3 Credit Hours.

This course provides an introduction to the basic concepts of medical genetics and current areas of medical genetic research. The course reviews basic genetic concepts including the principles of Mendelian and nontraditional inheritance, cytogenetics, molecular genetics, quantitative and population genetics, and discuss important medical aspects of genetic counseling and pedigree analysis, dysmorphology, cancer genetics and counseling for inherited cancers, developmental genetics, prenatal diagnosis, newborn screening, and pharmacogenetics. Diagnosis and current research toward treatment and cure of common genetic disorders affecting metabolism, reproduction, the endocrine system, the functioning of the eye and the nervous system are discussed. An important aspect of the course will be a discussion of ethical issues in medical genetics. A basic background in genetics, cell biology, and biochemistry is assumed. Prerequisites: A basic background in genetics, cell biology, and biochemistry.

CSBL 7014. Anatomy 1. 5 Credit Hours.

This course provides the basic principles of human anatomy. Students have the opportunity to learn human anatomy as it relates to function through the study of bones, cadaver prosections, models, atlas drawings and photographs, and their own bodies. Concentration is on osteology, radiology, arthrology, neuromuscular, vascular, and basic systems anatomy as they apply to physical therapy. Course fees: Lab Assistance fee \$10 per hour Gross Anatomy Lab fee \$30.

CSBL 7099. Dissertation. 0.5-12 Credit Hours.

Registration for at least one term is required of Ph.D. candidates. Prerequisites: admission to candidacy for Doctor of Philosophy degree.

CSBL 8010. Anatomy 2. 2 Credit Hours.

This course reinforces principles of human anatomy studied in CSBL 7014. Students study human anatomy as it relates to function through cadaver dissection. Concentration is on osteology, radiology, arthrology, neuromuscular, vascular, and basic systems anatomy as they apply to physical therapy. Course fees: Lab Assistance fee \$10 per hour Gross Anatomy Lab fee \$30 Human Materials fee \$865.

PHYT Courses**PHYT 5009. Neuroscience 1. 3 Credit Hours.**

This course in neuroscience provides the foundation to understand the structure and functions of the developing, mature, and aging nervous system. It covers basic neuroanatomy, neurophysiology, and neuropharmacology. It also applies neuroscience to clinical applications regarding pathology and patient care. Since cultural organization is central to most functional concepts, neuroanatomy is emphasized to facilitate an overall understanding of the nervous system. Morphology is covered first at the cellular level, then regionally. Neurophysiology of cellular processes of nerve cell transmission as well as regional connectivity of pathways devoted to specific neural modalities is covered. Neuropharmacology encompasses the chemical aspects of synaptic transmission at the cellular level, and the regional differences of transmitter pharmacology. Neuropathology is introduced when appropriate to the systems being discussed. Open for Cross Enrollment on Space Available basis.

PHYT 5091. Special Topics. 0.5-4 Credit Hours.

This course will be arranged through Department faculty. The course topics vary according to student interest. Semester hours are variable and credit hours will be assessed per topic. The course could be offered any time during the third year (MPT-III), fall or spring.

PHYT 7001. Clinical Foundations 1. 4 Credit Hours.

This course addresses the fundamental concepts of physical therapy practice including basic clinical screening for disease to include systems review, diagnostic procedures, and introductory physical therapy skills. Students are exposed to the components of documentation, basic examination, therapist-to-patient interaction, the disablement process, interdisciplinary management of the patient, and the use of the Guide to Physical Therapy as a management tool. Students also study functional screening techniques, body mechanics, surface anatomy, postural assessment, patient positioning and transfers, locomotion, and the use of assistive devices. The course adds to the foundation for clinical reasoning and clinical decision making. Students have the opportunity to practice fundamental skills involved in patient management.

PHYT 7005. Exercise and Physiology of Rehabilitation. 4 Credit Hours.

The goal of this course is to introduce the student to the application of exercise principles to different populations. This will be achieved by examining the physiology of exercise and applying the principles of therapeutic exercise to different populations. Emphasis is on the role of exercise to improve function, prevent dysfunction, and promote wellness. The role of complementary medicine and integration of interdisciplinary professionals in the presentation of content is intended to enhance understanding of holistic care for active populations. The effects of exercise on energy metabolism, nutrition, cardiopulmonary function, and the musculoskeletal systems are also emphasized in this course. At the end of this course, students will have had the opportunity to learn to be able to apply training principles to develop an appropriate exercise program.

PHYT 7009. Neuroscience 1. 3 Credit Hours.

This course in neuroscience provides the foundation to understand the structure and functions of the developing, mature, and aging nervous system. It covers basic neuroanatomy, neurophysiology, and neuropharmacology. It also applies neuroscience to clinical applications regarding pathology and patient care. Since cultural organization is central to most functional concepts, neuroanatomy is emphasized to facilitate an overall understanding of the nervous system. Morphology is covered first at the cellular level, then regionally. Neurophysiology of cellular processes of nerve cell transmission as well as regional connectivity of pathways devoted to specific neural modalities is covered. Neuropharmacology encompasses the chemical aspects of synaptic transmission at the cellular level, and the regional differences of transmitter pharmacology. Neuropathology is introduced when appropriate to the systems being discussed. Open for Cross Enrollment on Space Available basis.

PHYT 7011. Clinical Foundations 2. 4 Credit Hours.

This course continues to introduce the fundamental concepts of physical therapy practice including basic clinical screening, systems review, and introductory physical therapy skills. The course takes a regional approach to surface anatomy and its radiologic correlates, detailed muscle function with specific muscle testing. Functional outcome measures, palpation, and principles of selected interventions to include soft tissue massage and proprioceptive neuromuscular facilitation (PNF). The course will continue to lay the foundation for clinical reasoning and clinical decision making. The student will be given the opportunity to practice fundamental skills involved in patient management.

PHYT 7012. Movement Science 1. 4 Credit Hours.

This course is a study of joint structure and function, and the mechanical principles underlying the kinematics and kinetics of human motion. Emphasis is placed on the interaction between biomechanical and physiological factors in musculoskeletal function and the implications of kinesiology principles in physical therapy practice.

PHYT 7014. Systematic Reasoning and Scientific Investigation 1. 3 Credit Hours.

This course is designed to develop critical thinking regarding interpretation of research literature. It provides a general introduction to research design, statistical reasoning, and interpretations of the literature. Topics include scientific method, research design, statistical reasoning, development of research questions, issues of measurement, and an overview of parametric and non-parametric statistical techniques. All topics are presented to facilitate understanding of research literature and utilizing evidence for clinical decision-making. The learner will have the opportunity to be able to critically analyze rehabilitation research and begin the process of formulating a critically relevant research question. Open for Cross Enrollment on Space Available basis.

PHYT 7017. Cells, Systems, and Disease. 3 Credit Hours.

This course characterizes what happens to the human body during different disease processes. It begins at the cellular and tissue levels and advances to a progressive study of diseases and disorders within different organ systems. It examines the pathological changes of both histological and gross anatomical specimens, as well as the biochemical and physiological changes that occur during different diseases and disorders. It also discusses some aspects of diagnosis and treatment of these disorders. There is an extensive medical vocabulary associated with this course. Open for Cross Enrollment on Space Available basis.

PHYT 7018. Pharmacological Principles in Physical Therapy. 2 Credit Hours.

This course provides the foundation for understanding the impact of drugs on patients with conditions encountered in the practice of physical therapy. Basic pharmacological principles are addressed, as well as important precautions and contraindications for physical therapy treatments. Open for Cross Enrollment on Space Available basis.

PHYT 7019. Neuroscience 2. 3 Credit Hours.

This course in neuroscience provides further foundation to understand the structures and functions of the developing, mature, and aging nervous system. It covers basic neuroanatomy, neurophysiology, and neuropharmacology. It also applies neuroscience to clinical applications regarding pathology and patient care. Since structural organization is central to most functional concepts, neuroanatomy is emphasized to facilitate an overall understanding of the nervous system. Special emphasis is given to the structures involved in motor control, their functions, and pathologies. Open for Cross Enrollment on Space Available basis.

PHYT 7021. Clinical Experience 1. 5 Credit Hours.

Clinical Experiences 1, 2, and 3 are designed for the student to apply knowledge gained in the basic and clinical sciences courses completed in the first 2 years to clinical practice. The student will become proficient in examination, evaluation, and intervention of patients in a variety of physical therapy settings. Students will complete 10 week rotations in each of 3 settings: acute, inpatient neurological, and outpatient orthopedic. However, they may complete these in any order depending on availability of clinical sites.

PHYT 8002. Management of the Patient with Musculoskeletal Dysfunction. 1.5 Credit Hours.

Students in this course integrate previously learned skills and knowledge and apply new skills in the examination, evaluation, and intervention of patients across the lifespan with musculoskeletal conditions of the upper quarter, which will include the cervical and thoracic spine and the upper extremity. The course reviews musculoskeletal tissues, the effects of systematic disease on musculoskeletal tissues, the physical therapy exam, and the principles of evidence-based practice. The course then follows a regional approach with attention to the examination and intervention of the cervical/thoracic spine and each joint area in the upper extremity. Students are expected to be knowledgeable and proficient in material from the first-year courses in the areas of patient care skills, anatomy, kinesiology, and therapeutic exercise. The course emphasizes 1) using the best available evidence to examine and treat patients with musculoskeletal complaints in the extremities, 2) critically analyzing the patient's history and tests and measures to formulate a physical therapy diagnosis and determine the need for further referral, 3) recognizing non-musculoskeletal causes of extremity pain and identifying patients needing further diagnostic studies and referral to a specialty physician, and 4) the interdisciplinary approach to patient management through guest speakers from different medical specialties.

PHYT 8007. Orthotics in Rehabilitation. 1.5 Credit Hour.

The goal of this course is for the student to become proficient in the basic principles and clinical application of orthotic interventions used in the interdisciplinary management of the patient with extremity or spinal disorders across the lifespan. The course addresses the examination of the patient in need of an orthotic device, analyzing the results of the exam, and use of the best available evidence to identify the most efficacious orthotic device to manage or prevent impairment, functional limitation, or disability. Students will have the opportunity to use their critical thinking skills to problem solve case situations and prescribe or fabricate an orthosis most efficacious according to the best available evidence and with consultation from other disciplines.

PHYT 8011. Therapeutic Approaches to Pain and Movement Dysfunction. 3 Credit Hours.

This course examines the management of pain and movement disorders with various interventions. Content includes both direct and indirect effects of interventions with a biopsychosocial approach to patient-centered care. Theory and application of modalities within this course include soft tissue massage/mobilization (STM); tissue integrity; inflammation and repair; and principles and application of electrophysical agents in clinical PT, including cryotherapy, heat and electrical stimulation. The course consists of lectures, labs, "passport" self-selected site visits to experience clinical application of modalities used in physical therapy.

PHYT 8012. Prosthetics in Rehabilitation. 1.5 Credit Hour.

This course is designed to enable the student to become proficient in the principles of examination and intervention for the patient who experiences limb amputation or has congenital limb absence. The course includes the management of wounds and co-morbidities that put one at risk for limb amputation and strategies to identify these patients and prevent limb loss. The student learns the care and prosthetic management of patients in the pre and post-operative stages with limb amputation at different levels. Instructors present strategies to problem solve when presented with patients with other conditions or factors that complicate the patient's course of rehabilitation. The interdisciplinary management of patients with limb amputation is emphasized through clinical experience with a prosthetist.

PHYT 8013. Management of the Patient With Cardiopulmonary Dysfunction. 3 Credit Hours.

This course provides instruction in the basic science and clinical foundation required for the examination and treatment of disorders of the cardiovascular and pulmonary systems. Emphasis is on interpretation of evaluative results involving cardiovascular and pulmonary pathology and application of specific treatment interventions in developing comprehensive PT management of these classes of pathology. This course includes interdisciplinary presentations and opportunities relevant to evidence-based wellness and fitness programs for the physical therapist functioning as part of the cardiovascular and pulmonary rehabilitation team.

PHYT 8014. Seminar in Physical Therapy Patient Care. 1 Credit Hour.

This course is designed to promote integration of knowledge from basic sciences, patient care, health promotion and scientific investigation to enhance patient outcomes. Emphasis will be placed upon facilitation of student review of patient cases/ profiles with selection of tests and measures and potential treatment interventions.

PHYT 8021. Clinical Experience 2. 5 Credit Hours.

Clinical Experiences 1, 2, and 3 are designed for the student to apply knowledge gained in the basic and clinical sciences courses completed in the first two years to clinical practice. The student will become proficient in examination, evaluation, and intervention of patients in a variety of physical therapy settings. Students will complete 10 week rotations in each of 3 settings: acute, inpatient neurological, and outpatient orthopedic. However, they may complete these in any order depending on availability of clinical sites.

PHYT 8022. Professional Issues and Clinical Decision-Making 1. 2 Credit Hours.

This course is designed for the student to assimilate major theories about learning across the lifespan, learning style, teaching techniques, communication in the clinical setting, and communication as a means to develop cultural competence. Emphasis will be on instruction related to clinical practice and critical thinking as well as application to motor learning. A major theme of this course is the development of communication skills to enhance therapist-patient interactions, promote an understanding of learning across the lifespan, and develop cultural competence. Open for Cross Enrollment on Space Available basis.

PHYT 8075. Human Development across the Lifespan. 3 Credit Hours.

The purpose of this course is to provide the student with the opportunity to learn about typical human lifespan development with the emphasis on health and wellness with application to the practice of PT. The course focuses on the embryonic development, early infancy, childhood, adolescence, adulthood, older adults, and the oldest old. Opportunities for didactic, clinical, and community are integrated into the course to facilitate active learning opportunities. Topics may include interdisciplinary management, cultural sensitivity, psychological factors, socioeconomic concerns, community-based resources, and patient/family education regarding health and wellness/fitness. Open for Cross Enrollment on Space Available basis.

PHYT 8102. Systematic Reasoning and Scientific Investigation 2. 2 Credit Hours.

The emphasis of this course is continued development of critical thinking skills to promote evidence-based practice in the clinical setting. This course is a continuation of Systematic Reasoning and Scientific Investigation 1, and gives the student the support to experience and complete an extensive Critically Appraised Topic or a written research investigation. The student will also practice in small group format the skill of research articles analysis and presentation for public health and education. Students will either submit one article to the APTA Hooked on Evidence website or practice applying for a speaking position for a TPTA conference. The student will also produce either a written research investigation relevant to the practice of PT or a written Critically Appraised Topic with an extensive review of literature. Students also generate an oral presentation of their project to complete the requirements for this course.

PHYT 8106. Principles of Administration in Physical Therapy. 2 Credit Hours.

This course examines current issues and trends in law, ethics and practical aspects of physical therapy clinical management. Specific topics include: (1) health care malpractice and business, contract, criminal, education, and workers' compensation legal concepts and cases; (2) informed consent; (3) organizational theory, behavior, and culture; (4) leadership and management principles; (5) human resource management issues, including recruitment, selection, and retention of staff and managerial human resources; leadership; supervision, and delegation of PTAs, aides, and other extenders; performance appraisal; training and development activities; compensation issues; management labor relations; grievance and discipline; work place safety; and employment law and regulations; (6) health care finance, including clinical budgeting, billing, and reimbursement issues; (7) starting and marketing a PT business; (8) quality, risk, and information management; and (9) comparing and contrasting business, organizational, and professional (ATPA) ethics.

PHYT 8108. Management of the Patient with Neuromuscular Dysfunction 1. 5 Credit Hours.

This course is designed to allow the student to develop the skills necessary to perform examination, evaluation, diagnosis, prognosis, and the development of comprehensive treatment plan of care for patients with neuromuscular dysfunction. Emphasis will be on differential diagnosis, screening, examination, and evaluation of function, and on development of intervention programs that lead to improvement in function. Movement dysfunction will be covered across the lifespan for acute and chronic conditions. The topics will be presented from a problem-solving approach that integrates case studies. Current evidence-based research related to the management of the patient with neuromuscular dysfunction will be critically assessed.

PHYT 8112. Management of the Complex Patient. 3.5 Credit Hours.

This course gives the student the opportunity to practice examination techniques with a systems approach. Screening for conditions requiring referral will be practiced with continued diagnosis, prognosis to include plan of care using the PT Guide to Physical Therapy Practice. The student will generate a case study that will incorporate specific anatomical correlations with images related to the patient case and will be presented to the class for integration of anatomical relationships to patient care. Faculty from the Department of Cell Systems & Anatomy will supervise the peer teaching in the anatomy laboratory.

PHYT 8114. Management of the Patient with Musculoskeletal Dysfunction 2. 5 Credit Hours.

Students in this course integrate previously learned skills and knowledge and apply new skills in the examination, evaluation, and intervention of patients across the lifespan with musculoskeletal conditions of the lumbosacral spine and the lower quarter. The course follows a regional approach with attention to the examination and intervention of the lumbosacral spine, the sacroiliac joint, and each joint of the lower extremity. Students are expected to be knowledgeable and proficient in material from the first-year courses of patient-care skills, kinesiology, and therapeutic exercise. This course emphasizes 1) using the best available evidence to examine and treat patients with spine complaints, and 2) recognizing non-musculoskeletal causes of spinal pain and identifying patients needing further diagnostic studies and referral to a specialty physician.

PHYT 8116. Management of the Patient with Neuromuscular Dysfunction 2. 5 Credit Hours.

This course is a continuation of Management of the Patient with Neuromuscular Dysfunction 1, and is designed to allow the student to continue to develop the skills necessary to perform examination, evaluation, diagnosis, prognosis, and the development of comprehensive intervention plans of care for patients with neuromuscular dysfunction. Emphasis is on differential diagnosis, screening, examination, and evaluation of function, and on development of intervention programs that lead to improvement in function. Movement dysfunction is covered across the lifespan for acute and chronic conditions. Current evidence-based research related to the management of the patient with neuromuscular dysfunction is critically assessed. Management strategies and skills are reinforced by encouraging the students to participate in hands-on pre-clinical experiences, work with area clinicians related to specific diagnoses, and design treatment plans based on case studies with a focus on interdisciplinary practice.

PHYT 8121. Clinical Experience 3. 5 Credit Hours.

Clinical Experiences 1, 2, and 3 are designed for the student to apply knowledge gained in the basic and clinical sciences courses completed in the first 2 years to clinical practice. The student is required to become proficient in examination, evaluation, and intervention of patients in a variety of physical therapy settings. Students are required to complete 10 week rotations in each of 3 settings: acute, inpatient neurological, and outpatient orthopedic. However, they may complete these in any order depending on availability of clinical sites.

PHYT 8122. Professional Issues and Clinical Decision-Making 2. 2 Credit Hours.

This course explores professional issues in physical therapy practice. Topics of emphasis include Vision 2020, professional behaviors, APTA Code of Ethics and Guide to Professional Conduct, and legal standards of behavior for physical therapists. Particular emphasis will be placed on communication and conflict resolution, personality and cultural diversity, stress management, and entry-level physical therapy skill performance. There will also be an interdisciplinary component to the course that will provide students with an overview of ethical issues facing allied health professionals. Topics to be discussed include responsibilities of the health care professional, life and death decisions, patient confidentiality, substance abuse, whistle-blowing, and informed consent. Ethics in research and other critical issues related to health care problems also will be addressed. Collaborative activities and simulated cases will be used to enhance discussion among students.

PHYT 8130. Movement Science 2. 2 Credit Hours.

The course will examine how humans learn and acquire skills, as well as the mechanisms that are used to control skillful movement utilizing integration of concepts from neuroscience and kinesiology. Content will include critical discussion of the various schools of thought on how movement is controlled and learned. Students will have the opportunity to apply the concepts of motor control and motor learning for patients with movement dysfunction. Emphasis will be placed on movement control and motor learning in normal and special populations.

PHYT 8221. Clinical Internship. 2 Credit Hours.

This course is a four-week clinical internship that allows the student to choose an area of interest and refine their physical therapy examination, evaluation, and intervention skills in that setting. Students may choose to gain more experience in one of the three required clinical areas (acute, inpatient neurological, outpatient orthopedic) or pursue a specialty area of interest.

PHYT 8222. Professional Issues and Clinical Decision-Making 3. 1 Credit Hour.

This course gives students the opportunity to prepare for their clinical experiences. Students are required to complete all required certifications and learn to use the clinical evaluation tool (PT MACS). Particular emphasis will be placed on satisfactory passing criteria for skills outlined in the PT MACS, and expected entry-level physical therapy skill performance.