

## HEALTH SCIENCE II: PHYSICAL THERAPY

*Health Science Education II: Physical Therapy* is an extended laboratory experience at the student's choice of clinical site designed to provide students the opportunity to assume the role of physical therapy assistant and practice technical skills previously learned in the classroom, including information on the health care system and employment opportunities at a variety of entry levels, an overview of the health care delivery systems, health care teams and legal and ethical considerations. It prepares students with the knowledge, skills and attitudes essential for providing basic care in extended care facilities, hospitals and home health agencies under the direction of licensed Physical Therapists. In addition students will learn skills specific to physical therapy including observing patients progress, helping patients do specific exercises, using massage and stretching for treatment, aiding patients with devices for movement, educating patient and families, as well as basic assisting in cleaning treatment areas and clerical work. This course also provides students with the knowledge, attitudes, and skills needed to make the transition from school to work in health science careers, including self-analysis to aid in career selection, job seeking and job maintenance skills, personal management skills, and completion of the application process for admission into a post-secondary program. HOSA, the health science student organization, encourages development of leadership, communication, community service and health care related skills

- Recommended Grade Level: Grade 12
- Recommended Prerequisites: Health Science Education I
- Credits: 3 credits per semester, maximum of 6 credits.

### Application of Content

Intensive laboratory applications are a component of this course and may be either school based or work based or a combination of the two. Work-based learning experiences should be in a closely related industry setting. Instructors shall have a standards-based training plan for students participating in work-based learning experiences

### Career and Technical Student Organizations (CTSOs)

Career and Technical Student Organizations are considered a powerful instructional tool when integrated into Career and Technical Education programs. They enhance the knowledge and skills students learn in a course by allowing a student to participate in a unique program of career and leadership development. Students should be encouraged to participate in HOSA the CTSOs for the most closely related subject matter areas.

## Content Standards

### Domain I. Healthcare Administration

#### Core Standard 1

*Student must possess basic knowledge of healthcare administration and healthcare systems*

##### Standards

PTA-1.1 Understand the variety of insurances and healthcare plans patients will use to receive services

PTA-1.2 Control the quality of care for patients including the regulations dictated by state federal guidelines

- HIPAA
- Health Insurance and Portability Accountability Act
- Informed consent
- Americans with Disabilities
- Statutory Laws

PTA-1.3 Review ethical Issues, malpractice and sexual harassment laws

### Domain II. Physical Therapy-Body Systems

#### Core Standard 2

*Student must demonstrate basic knowledge and proficiency working with the musculoskeletal system*

##### Standards

- PTA-2.1 Know the components of the musculoskeletal system including but not limited to: Bones, Fascia, Tendon, Ligament, Muscle, Cartilage, Joint, and Joint Receptors
- PTA-2.2 Identify specific joints and their component parts as well as the range of motion provided including the shoulder, elbow, wrist/hand, hip, knee, ankle/foot, craniovertebral, cervical, temporomandibular, thoracic, lumbar, sacroiliac
- PTA-2.3 Study the kinesiology of the musculoskeletal system including directional terms, movements and body segments, levers, osteokinematics, degrees of freedom, arthrokinematics, close packed and open packed joint positions, capsular and non-capsular patterns of restriction
- PTA-2.4 Review musculoskeletal injury and repair involving muscles, tendons, ligaments, tissue healing, articular cartilage injury and disease
- PTA-2.5 Collect Data on the musculoskeletal system such as range of motion, end feels, leg length, manual muscle testing, deep tendon reflexes, upper/lower quarter screens, posture analysis, palpation, girth measurement, joint mobility, special tests
- PTA-2.6 Identify the following musculoskeletal pathologies: fractures, bursitis, degenerative joint disease, rheumatoid arthritis, Lupus, ankylosing spondylitis, psoriatic arthritis, gout, fibromyalgia, tendonitis, ruptured achilles, acromioclavicular injuries, adhesive capsulitis, sprains, ligament tears, bicipital tendonitis, carpal tunnel, De Quervain tenosynovitis, epicondylitis, finger injuries, groin pain, hallux valgus, herniated nucleus pulposus, iliotibial band friction syndrome, MCL sprain, meniscus injuries, osteoarthritis, patellofemoral dysfunction, plantar fasciitis, rotator cuff, scaphoid fracture, spinal stenosis, spondylolysis, thoracic outlet syndrome, wrist fractures
- PTA-2.7 Recognize common orthopedic surgical repairs like spinal surgery and total joint replacement

### **Core Standard 3**

*Student must demonstrate basic knowledge and proficiency working with the neuromuscular system*

#### **Standards**

- PTA-3.1 Know the basic anatomy, physiology, organization of the nervous system, central nervous system, peripheral nervous system, and nerves of the somatic nervous system
- PTA-3.2 Identify reflexes including monosynaptic, superficial, pathologic, patterned behavioral, supraspinal, protective, etc.
- PTA-3.3 Distinguish proprioception, balance, and kinesthesia and understand how the body performs each
- PTA-3.4 Perform neuromuscular examination including levels of consciousness, upper/lower quarter scanning examination, cranial nerve examination, and reflex testing
- PTA-3.5 Define the purpose of the following diagnostic procedures and know when each should be performed: cerebral angiography, computed tomography, electroencephalography, electromyogram, evoked potential, lumbar puncture, MRI and MRA, Myelography, PET, Ventriculography, Electronystagmography
- PTA-3.6 Recognize common neurologic dysfunctions, infectious diseases, and neural injuries affecting the neuromuscular system: cerebrovascular accident, transient ischemic attack, aneurysm, traumatic brain injury, spinal cord injury, syringomyelia, cauda equina syndrome, neurodegenerative, idiopathic inflammatory myopathies, epilepsy, cerebellar disorders, vestibular disorders, basal ganglia disorders, cranial and peripheral disorders, herniated lumbar disc, herpes zoster
- PTA-3.7 Compare and contrast motor learning and theories of neurological rehabilitation

### **Core Standard 4**

*Student must demonstrate basic knowledge and proficiency working with the Cardiovascular system*

#### **Standards**

- PTA-4.1 Identify and know the function of the various component parts of the cardiovascular system including peripheral circulation, lymphatic system, heart, veins, and arteries, etc.
- PTA-4.2 Perform basic cardiovascular examinations such as blood pressure, pulse, examination of heart sounds and heart rhythm
- PTA-4.3 Practice exercise tolerance testing using Borg Rating of Perceived Exertion scale
- PTA-4.4 Be able to execute basic life support (CPR) and understand the significance of diagnostic tests: coronary angiogram, duplex ultrasonography, magnetic resonance venography, physiologic tests of venous function, Doppler

ultrasound, air plethysmography, chest radiograph, myocardial perfusion imaging, continuous hemodynamic monitoring, echocardiography

PTA-4.5 Comprehend the variety of laboratory tests including enzyme studies, lipid profile, cellular blood elements and make evaluations based on them

PTA-4.6 Identify common cardiovascular conditions, peripheral arterial disease, vascular diseases, congestive heart failure, cardiomyopathy, coronary artery diseases, inflammatory conditions of the heart

PTA-4.7 Recognize common surgical interventions and cardiac rehabilitation

### **Core Standard 5**

*Student must demonstrate basic knowledge and proficiency working with the Pulmonary system*

#### **Standards**

PTA-5.1 Identify the anatomy and physiology of the pulmonary system including but not limited to ribs, lungs, pleurae, and muscles

PTA-5.2 Understand the significance of pulmonary pathology and the variety of procedures performed to diagnose and characterize diseases of the pulmonary system

PTA-5.3 Recognize pulmonary obstructive diseases, infectious and inflammatory diseases, restrictive lung disease, pulmonary oncology, pulmonary vascular disease, and pleural diseases and disorders

PTA-5.4 Perform physical therapy interventions, medical management and medical interventions specific to the pulmonary system

### **Core Standard 6**

*Student must demonstrate basic knowledge and proficiency working with the Integumentary system*

#### **Standards**

PTA-6.1 Identify the anatomy and physiology of the integumentary system including dermis, epidermis, hair, glands, etc.

PTA-6.2 Describe the various pathologies of skin including eczema, dermatitis, bacterial, fungal, and parasitic infections, melanin pigmentary disorders, benign dermatoses, autoimmune disorders, skin cancer, ulcers

PTA-6.3 Perform wound care and identify factors influencing wound healing, include various non-physical therapy interventions as well

PTA-6.4 Understand the complexity of burns and complications that result from burns; including burn healing management

## **Domain III. Pathology**

### **Core Standard 7**

*Student must possess knowledge of basic pathology as it relates to physical therapy*

#### **Standards**

PTA-7.1 Understand the role and importance of the immune system and identify its major organs and cells (e.g. antibodies, lymphocytes, etc)

PTA-7.2 Identify various autoimmune and infectious diseases

PTA-7.3 Define the interconnectedness of various systems identified in previous standards with the immune system, in addition to including gastrointestinal system and genitourinary

PTA-7.4 Study hematologic blood disorders, endocrine and metabolic disorders

PTA-7.5 Examine various pathologies pertaining to obstetrics and gynecology

PTA-7.6 Review complex disorders such as chronic fatigue syndrome, fibromyalgia, myofascial complex regional pain and the role physical therapy may play with pain alleviation and maintenance

## **Domain IV. Physical Therapy for Children and Elderly**

### **Core Standard 8**

*Student will understand the significance of pediatric physical therapy and the role it has in child development*

#### **Standards**

PTA-8.1 Describe the various developmental milestones from birth to adolescence

PTA-8.2 Identify automatic postural responses, primitive reflexes, motor control, and motor development

- PTA-8.3 Review the commonly accepted theories of child development
- PTA-8.4 Understand prenatal development and the significance of infant screening
- PTA-8.5 Perform comprehensive developmental assessments, motor assessments, and assessments for children with disabilities
- PTA-8.6 Review various pediatric acquired conditions, traumatic brain injury, congenital conditions, and pediatric oncology

### **Core Standard 9**

*Student will understand the significance of geriatric physical therapy and the role it has with the aging process*

#### **Standards**

- PTA-9.1 Understand the process of aging process and the commonly accepted theories of aging
- PTA-9.2 Recognize the physiological changes and adaptations that occur and the pathological conditions associated with aging
- PTA-9.3 Identify common functional problems arising from the aging process and how physical therapy can improve the quality of life associated with these problems
- PTA-9.4 Know the principals of geriatric rehabilitation and ethical and legal issues associated with working with this population

## **Domain V. Exercise and function**

### **Core Standard 10**

*Students will perform and be proficient in therapeutic exercise and modalities*

#### **Standards**

- PTA-10.1 Know the biomechanics of common exercises
- PTA-10.2 Identify the physiology of muscles, muscle function and contraction
- PTA-10.3 Create procedures and plans for improving strength, endurance, flexibility, balance, joint stabilization, and coordination within a variety of patients
- PTA-10.4 Define modalities of therapeutic exercise including physical agents, hydrotherapy, electrotherapeutic modalities, mechanical modalities

### **Core Standard 11**

*Students will identify and understand the use of prosthetics and orthotics*

#### **Standards**

- PTA-11.1 Understand the levels of amputation
- PTA-11.2 Perform activities to improve function and training of an amputee
- PTA-11.3 Recognize lower limb and upper limb prosthetics and understand how they are able to replicate human movement
- PTA-11.4 Identify various orthotics and the conditions they alleviate

### **Core Standard 12**

*Students will understand and practice basic pharmacology, gait and functional training*

#### **Standards**

- PTA-12.1 Identify the role of pharmacotherapy and the most common pharmaceuticals used for patients
- PTA-12.2 Define the temporal parameters and the gait cycle
- PTA-12.3 Assist individuals with stair negotiation, wheel chairs, and bed mobility and transfers

## **Common Core Literacy Standards for Technical Subjects**

### **Reading Standards for Literacy in Technical Subjects 11-12**

The standards below begin at grade 11 and define what students should understand and be able to do by the end of grade 12. The CCR anchor standards and high school standards in literacy work in tandem to define college and career readiness expectations – the former providing broad standards, the latter providing additional specificity.

### **Key Ideas and Details**

- 11-12.RT.1 Cite specific textual evidence to support analysis of technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- 11-12.RT.2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
- 11-12.RT.3 Follow precisely a complex multistep procedure when performing technical tasks; analyze the specific results based on explanations in the text.

### **Craft and Structure**

- 11-12.RT.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific context relevant to *grades 11-12 texts and topics*.
- 11-12.RT.5 Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
- 11-12.RT.6 Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.

### **Integration of Knowledge and Idea**

- 11-12.RT.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
- 11-12.RT.8 Evaluate the hypotheses, data, analysis, and conclusions in a technical subject, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
- 11-12.RT.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

### **Range of Reading and Level of Text Complexity**

- 11-12.RT.10 By the end of grade 12, read and comprehend technical texts in the grades 11-CCR text complexity band independently and proficiently.

### **Writing Standards for Literacy in Technical Subjects 11-12**

The standards below begin at grade 11 and define what students should understand and be able to do by the end of grade 12. The CCR anchor standards and high school standards in literacy work in tandem to define college and career readiness expectations – the former providing broad standards, the latter providing additional specificity.

### **Text Types and Purposes**

- 11-12.WT.1 Write arguments focused on *discipline-specific content*.
- 11-12.WT.2 Write informative/explanatory texts, including technical processes.
- 11-12.WT.3 Students will not write narratives in technical subjects. *Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In technical, students must be able to write precise enough descriptions of the step-by-step procedures they use in their technical work that others can replicate them and (possibly) reach the same results.*

### **Production and Distribution of Writing**

- 11-12.WT.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- 11-12.WT.5 Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
- 11-12.WT.6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

### **Research to Build and Present Knowledge**

- 11-12.WT.7 Conduct short as well as more sustained research projects to answer a question (including a self-

generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

11-12.WT.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation

11-12.WT.9 Draw evidence from informational texts to support analysis, reflection, and research.

**Range of Writing**

11-12.WT.10 Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.