

## SYLLABUS

**Name of Course:** Cardiovascular Physiopathology – PHPA-224

**Length of Course:** 3.5 units, 55 hours (5 hours lecture/week)

**Course Description:**

The normal parameters and physiological processes of the cardiovascular system are discussed in relationship to the important pathological conditions with the goal being to facilitate a better understanding of how to maintain cardiovascular health. Emphasis is placed on blood pressure. Concepts related to blood pressure measurement, control, adaptability, and management are considered. The development of an analytical, diagnostic thought process is encouraged and cultivated through an interactive teaching style. This course provides content in both physiology and pathology.

**Prerequisites:** PHYS-122, PATH-120

**Course Offered By:** Basic Science Department

**Required Reading:** Terret AGJ. Vascular accidents from cervical spine manipulation: The mechanisms. *J Aust Chiropractors' Assoc* 1987; 17:131-44

**Recommended Text:** Marieb EN Human Anatomy & Physiology. 9th ed. 2013

**Reference Texts:** Kumar V Robbins & Cotran Pathologic Basis of Disease. 9th ed. 2015 Hall and Guyton Textbook of Medical Physiology. 12th ed. 2011

**Materials:** Course notes are available in the bookstore.

**Method of Instruction:** Lecture is highly visual and interactive with student questions encouraged. Complex physiological principles are broken down during lecture. Numerous sample test questions are available to the student.. A visual presenter, power point slides, and a fill-in note packet appeal to various learning styles. Students are assigned a reading to apply knowledge gained in one particularly relevant module.

**Grades:** 50% based on an average of 4 quizzes given during the Wed.s of even weeks; 50% final exam (comprehensive) =100%

The quizzes are objective/Scantron tests with 11-36 questions total (one is a bonus) . THERE ARE NO MAKE - UP QUIZZES. The OAA does NOT administer make up quizzes.

The student may take all quizzes and drop the lowest or be absent from one w/o penalty. A cumulative final exam is given in multiple choice/scantron format. The total MCQ's is 52; the percent is calculated form 50; so the student can miss any 2 for 100%.

**The final grade** will be determined by the following scale:

A 4.0 Superior 90 - 100%

B 3.0 Above Average 80 - 89%

C 2.0 Average 70 - 79%

F 0.0 Fail 69 – below, the student must repeat the course

**Grades and the Grading System Final Grades** are available online through the CAMS student portal. If there are any questions on grading procedures, computation of grade point average, or the accuracy of the grade report, please contact the Registrar's Office or the Office of Academic Affairs. Grades will be reported and evaluation will be based on the Academic Policies, Procedures, & Services. Please refer to Evaluation Policy (**Policy ID: OAA.0007**)

In order to maintain **Satisfactory Academic Progress**, a student must maintain a 2.0 or better in each and every course. **Any grade less than a C must be remedied by repeating the class.** Please refer to Satisfactory Academic Progress (**Policy ID: OAA.0006**)

**Attendance:** Please refer to Attendance Policy (**Policy ID: OAA.0002**)

**Conduct and Responsibilities:** Please refer to the Personal Conduct, Responsibility and Academic Responsibility Policy (**Policy ID: OAA.0003**)

**Make-up Exams:** Please refer to Make-up Assessment Policy (**Policy ID: OAA.0001**)

**Request for Special Testing:** Please refer to Request for Special Testing (**Policy ID: OAA.0004**)

### **Accommodation for Students with Disabilities:**

If you have approved accommodations, please make an appointment to meet with your instructor as soon as possible. If you believe you require an accommodation, but do not have an approved accommodation letter, please see the Academic Counselor Lori Pino in the Office of Academic Affairs. Contact info: [Lpino@lifewest.edu](mailto:Lpino@lifewest.edu) or 510-780-4500 ext. 2061. Please refer to Service for Students with Disabilities Policy (**Policy ID: OAA.0005**)

### **Electronic Course Management:**

**Canvas** is LCCW's Learning Management System (LMS). Canvas will be used throughout the quarter during this course. Lectures, reminders, and messages will be posted. In addition, documents such as the course syllabus and helpful information about the class project will be posted. Students are expected to check Canvas at least once a week in order to keep updated. The website address for Canvas is

<https://lifewest.instructure.com/login/canvas> Please refer to the Educational Technologies Policy (**Policy ID: OAA.0009**)

**Extra Credit:** Each quiz and the final exam have extra questions which count towards the point total.

**Independent Student Work** All exams must be the product of the individual student's original efforts for this class. Collaboration on other class assignments is permitted as defined by the instructor.

**Procedures for Reviewing Exams** The instructor has authorized access to old exams, which are available in the library and may be used for study purposes. Students may share copies of their exams with other students after the instructor has returned them.

### **Course Goal**

The goal of this class is to provide the student with a level of knowledge and understanding of the CV system which will contribute to the clinical skills necessary to manage health issues related to this system.

### **The Learning Objectives for CV PHPA are as follows:**

Week 1 • to survey the overall circulation and define a closed loop • to explain the significance of blood pressure • to define shock and stroke • to review the heart by histological layers • to relate the structure of these layers to the functions • to review  $CO = SV \times HR$  • to introduce normocardia and athlete's bradycardia • to define and correlate pathological conditions with the structures and functions

Week 2- Q#1 • to compare arteries with veins • to discuss heme as a pigment related to blood color and its significance • to address mechanisms of blood gas transport • to examine the structure of the vasculature by layers • to describe the structure/function correlation of vascular layers • to define the pathological conditions affecting these layers

Week 3 • to finish the study of the vascular pathologies • to review blood coagulation and thromboembolic episodes • to discuss VAD, strokes, and cervical adjusting • to establish principles governing blood flow – Poiseuille's Principle • to emphasize the significance of  $MAP = CO \times TPR$  • to introduce vital signs • to review blood pressure measurement-as part of vital signs • to define normal blood pressure ranges • to establish borderline hypertension

Week 4 - Quiz #2 • to give a brief overview of the autonomic nervous system • to discuss control of blood flow, central and local • to describe cardiac control by pacemaker potentials • to review the details of parasympathetic and sympathetic effects on the heart • to review the length/tension relationship of striated muscle • to explain

heterometric autoregulation and ejection fraction • to redefine congestive heart failure in the context of ejection fraction

Week 5 • to explain parasympathetic and sympathetic effects on the vasculature • to explain arteriolar autoregulation • to explain cardiovascular adaptations to cold and heat • to explain cardiovascular adaptations in a hypermetabolic state • to describe the benefits of aerobic conditioning • to identify safe and unsafe activities for hypertensives • to review the mechanisms of venous return • to define preload and afterload

Week 6 - Quiz #3 • to introduce types of circulatory shock • to introduce blood pressure regulatory mechanisms in time frame • to discuss in detail the short, intermediate, and long term pressure controls • to identify causes of hypertension • to define arterio and atherosclerosis

Week 7 • to introduce the detailed mechanism of plaque development and its time frame • to review the blood lipoproteins and cholesterol pathways • to define fatty yellow streak, foam cells, leiomyoma, and atheroma • to introduce C-reactive protein, myeloperoxidase, and the role of inflammation • to explain endothelial dysfunction and platelet derived growth factors in the process • to introduce the Framingham Heart study and risk factors of atherosclerosis

Week 8 - Quiz# 4 • to continue the identification and explanation of risk factors for atherosclerosis • to examine the atherosclerotic sequelae • to define myocardial infarction in a progression of stable and unstable angina • to delineate the nature of patient presentation of MI and compare male to female

Week 9 • to introduce diagnostic markers for myocardial infarction • to review the electrical conduction system of the heart • to review the ECG in a context of ischemic heart disease • to define arrhythmias including fibrillation • to review automaticity and ectopic foci

Week 10 - Quiz #5 • to review excitation, chemical coupling, and mechanical sliding of filaments • to explain the relationship of the ECG waves to the mechanical events of the cardiac cycle • to explain active and passive ventricular filling • to explain the ventricular pressure tracing with its isovolumetric and isotonic phases • to explain the function and timing of the heart valves • to define S1, S2, S3, and S4 • to define murmurs, stenosis, regurgitation, and normal mitral prolapse • to correlate valve action and murmurs with systole and diastole

### **Student Learning Outcomes**

**This course aligns with PLOs: (3 and 6)**

1. The student will demonstrate a thorough understanding of the normal and abnormal workings of the cardiovascular system as evidenced by passing a comprehensive final exam.

2. The student will be able to read and interpret literature relating mechanisms for stroke and VAD to issues surrounding chiropractic cervical adjustments as demonstrated by the class project testable on quiz #2.
3. The student will learn to analyze myocardial work effort, apply this to aerobic conditioning, and become better able to explain the benefits of exercise to future patients by practice in class and by assessment in Q#3 and the comprehensive final.
4. The student will demonstrate a thorough understanding of BP, including the role of the autonomic nerves in its regulation, as well as causes and prevention of hypertension as testable on Q# 3, 4, 5, and the comprehensive final exam.
5. The student can identify risk factors for cardiovascular disease testable on quiz # 5.

**Program Learning Outcomes (PLO):** Students graduating with a Doctor of Chiropractic degree will demonstrate proficiency in:

1. **ASSESSMENT AND DIAGNOSIS:** An assessment and diagnosis requires developed clinical reasoning skills. Clinical reasoning consists of data gathering and interpretation, hypothesis generation and testing, and critical evaluation of diagnostic strategies. It is a dynamic process that occurs before, during, and after the collection of data through history, physical examination, imaging, and laboratory tests.
2. **MANAGEMENT PLAN:** Management involves the development, implementation and documentation of a patient care plan for positively impacting a patient's health and well-being, including specific therapeutic goals and prognoses. It may include case follow-up, referral, and/or collaborative care.
3. **HEALTH PROMOTION AND DISEASE PREVENTION:** Health promotion and disease prevention requires an understanding and application of epidemiological principles regarding the nature and identification of health issues in diverse populations and recognizes the impact of biological, chemical, behavioral, structural, psychosocial and environmental factors on general health.
4. **COMMUNICATION AND RECORD KEEPING:** Effective communication includes oral, written and nonverbal skills with appropriate sensitivity, clarity and control for a wide range of healthcare related activities, to include patient care, professional communication, health education, and record keeping and reporting.
5. **PROFESSIONAL ETHICS AND JURISPRUDENCE:** Professionals comply with the law and exhibit ethical behavior.
6. **INFORMATION AND TECHNOLOGY LITERACY:** Information and technology literacy are manifested in an ability to locate, evaluate and integrate research and other types of evidence, including clinical experience, to explain and manage health-related issues and use emerging technologies appropriately.
7. **INTELLECTUAL AND PROFESSIONAL DEVELOPMENT:** Intellectual and professional development is characterized by maturing values and skills in clinical practice; the seeking and application of new knowledge; and the ability to adapt to change.
8. **BUSINESS:** Assessing personal skills and attributes, developing leadership skills, leveraging talents and strengths that provide an achievable expectation for graduate

success. Adopting a systems-based approach to business operations. Networking with practitioners in associated fields with chiropractic, alternative medicine and allopathic medicine. Experiencing and acquiring the hard business skills required to open and operate an on-going business concern. Participating in practical, real time events that promote business building and quantifiable marketing research outcomes

- 9. PHILOSOPHY:** Demonstrates an ability to incorporate a philosophically based Chiropractic paradigm in approach to patient care. Demonstrates an understanding of both traditional and contemporary Chiropractic philosophic concepts and principles. Demonstrates an understanding of the concepts of philosophy, science, and art in chiropractic principles and their importance to chiropractic practice.