

## ACADEMIC ASSOCIATE OF SCIENCE IN CARDIOVASCULAR SONOGRAPHY COURSES

### GENERAL EDUCATION COURSEWORK

Algebra I	ALG101	This course introduces the student to the basic rudiments of algebraic theory including the following: linear algebra, associative algebra, logarithmic scale, scientific notation, solving for x. Practice exercises are provided throughout the course.
Anatomy and Physiology I	AP101	In this course, students will learn the chemical basis of life, cellular metabolism, and the different types of tissues that comprise the human body. The structure and function of the integumentary, skeletal, and muscular systems of the human body will be taught.
Anatomy and Physiology II	AP102	In this course, students will learn the structure and function of the nervous, endocrine, blood, cardiovascular, immune and lymphatic systems of the human body. Electrical and chemical reactions, transport of substances, and defense mechanisms of the human body will be studied.
Anatomy and Physiology III	AP103	In this course, students will learn the structure and function of the digestive, respiratory, urinary, and reproductive systems of the human body. Nutrition and metabolism, water, electrolyte, and acid base balance will be discussed. Pregnancy, growth, and development will be studied. Students will also be introduced to the study of genetics and genomics.
Oral Communication	OCOM101	This course is designed to empower students to speak effectively in a public forum. Students will learn public speaking contexts, topic selection, audience analysis and ethical communication. Students will practice organizing and outlining ideas, constructing introductions and conclusions, and utilizing presentational aids. Students will deliver three speeches in this class; to include one demonstration speech, one informative speech, and one persuasive speech.
Written Communication	WCOM101	This course is designed to empower students to write effectively. Students will learn to choose topics and organize their ideas and materials. They will practice writing a first draft, editing and proof reading their work for errors. Additionally, students will undertake a research project following a systematic process.
<b>TECHNICAL COURSEWORK</b>		
Cardiovascular Sonography Lecture I	CAR221	Students will learn the anatomy, physiology, embryology and pathology of the cardiovascular system. Doppler principles including color flow mapping, color M-mode and tissue Doppler will also be emphasized.
Cardiovascular Sonography Laboratory I	CAR221L	This clinical/laboratory course is an introduction to Doppler principles, velocities, pathology and basic ultrasound physics. Emphasis will be placed on normal anatomy and disease state conditions. M-mode and measurements of valve area will be demonstrated. Students will learn probe manipulation for optimal visualization of anatomy.

<b>Cardiovascular Sonography Lecture II</b>	<b>CAR222</b>	Students will explore the pathophysiology of the heart focusing on diastolic and systolic dysfunction. They will also explore congenital heart defects, transesophageal echo and stress echo testing. They will learn to incorporate velocity measurements and implement calculation to document overall mechanical function of the heart. Case studies will be discussed and technical reports prepared.
<b>Cardiovascular Sonography Laboratory II</b>	<b>CAR222L</b>	This clinical/laboratory course will continue with Doppler Principles and explore pathophysiology of the heart. Extensive focus will be put on diastolic and systolic function as well as the hemodynamics of echocardiography. Students will recognize congenital heart defects, murmurs and equations to determine severity. They will learn to incorporate velocity measurements and implement calculation to document overall mechanical function. Students will perform echocardiograms on fellow students by utilizing scanning protocol standards.
<b>Electrocardiography</b>	<b>CAR220</b>	This course prepares the student to sit for CCT or CRAT certification exams with the globally recognized CCI, to become a Certified Cardiographic Technician or Certified Rhythm Analyst Technician, respectively. The course will introduce cardiac electrophysiology and electrocardiography concepts, techniques, and applications. The student will be trained to perform ECG protocols and to recognize and report various cardiac and pacemaker rhythms, conduction disturbances, and life-threatening conditions, with focus on patient care and management. The course will also explore Holter and telemetry monitoring in addition to different stress testing modalities and protocols and will conclude with a comprehensive approach to 12-lead ECG analysis and interpretation. In the lab, the student will learn to perform and analyze the standard 12-lead ECG on fellow students.
<b>Medical Terminology I</b>	<b>MT101</b>	Students will be introduced to medical terminology and learn how to build and analyze medical terms using prefixes, suffixes, roots and combining vowels. Students will practice building and defining medical terms for anatomical structures and pathologies associated with the various body systems. Writing medical reports and communicating with medical staff using medical terms and abbreviations will be discussed and practiced.
<b>Ultrasound Physics and Instrumentation Lecture</b>	<b>PHY201</b>	The properties of sound physics and machine instrumentation will be addressed. Students will gain a deeper understanding of the interactions of ultrasound within the human body and the proper use of ultrasound applications. Emphasis will be placed on ultrasound theory, parts of the machine, transducer construction/function and Doppler principles.
<b>Ultrasound Physics and Instrumentation Laboratory</b>	<b>PHY201L</b>	Students will learn “knobology” by scanning predetermined protocols that afford manipulation of specific knobs and machine function. Emphasis is placed

		on the technical aspects of scanning and applying the principles of physics.
<b>Vascular Sonography Lecture</b>	<b>VAS201</b>	This course will address vascular anatomy, physiology, hemodynamics and disease of the vascular system. Emphasis is placed on intra/extracranial vessels as well as vessels of the upper and lower extremity arterial and venous systems. Doppler, Bernoulli's Principle, Poiseuille's Law and relative statistics complete this course study.
<b>Vascular Sonography Laboratory</b>	<b>VAS201L</b>	Students learn with a hands-on approach to perform ultrasound on cerebral carotids and vessels of the upper and lower extremity both arterial and venous. Doppler waveforms and spectral analysis, as well as initial impressions are taught. ABI's, blood pressure, and intima medial thickness are explained.
<b>EXTERNSHIP</b>		
<b>Externship Preparation Laboratory I</b>	<b>EPL201</b>	This course prepares students for clinical application of their skills via externship with a focus on what will make students successful professionals upon graduation. Students will successfully complete all ultrasound protocols required in their program and required for clinical rotation. Students will also participate in career building tools required for long-term success in their chosen field of study, including professionalism, important clinical skills, patient care, case studies, and pathology. As a core component of this class, students must successfully complete all ultrasound protocols and pass an exit evaluation prior to Externship.
<b>Externship I (AAS)</b>	<b>EXT201</b>	Externship involves the direct interaction of the student within a specific medical environment. The student is assigned to a hospital, imaging center, clinic, or other environment in which ultrasound is performed on patients. Students observe and, when allowed by a supervisor, may perform a portion of the exam. This module serves to assist the student in making a successful transition from the school environment to a clinical setting. Students will write reports, present findings, and further explore pathologies.
<b>Externship II (AAS)</b>	<b>EXT202</b>	Externship involves the direct interaction of the student within a specific medical environment. The student is assigned to a hospital, imaging center, clinic, or other environment in which ultrasound is performed on patients. Students observe and, when allowed by a supervisor, may perform a portion of the exam. This module serves to assist the student in making a successful transition from the school environment to a clinical setting. Students will write reports, present findings, and further explore pathologies.