

**George Mason University**  
**College of Education and Human Development**  
**Kinesiology**

KINE 380.002 - Exercise Prescription and Programming for Special Populations  
3 Credits, Spring 2017  
Tuesday, Thursday/10:30-11:45am, Colgan Hall 203- SciTech Campus

**Faculty**

Name: Dr. Charles Robison  
Office hours: By Appointment  
Office location: Bull Run Hall 205  
Office phone: 703-993-7115  
Email address: crobiso4@gmu.edu

**Prerequisites/Corequisites**

KINE 310, KINE 350

**University Catalog Course Description**

This course provides study of the pathophysiology of common diseases and conditions with concentration in the design and implementation of exercise programs.

**Course Overview**

Not Applicable.

**Course Delivery Method**

This course will be delivered using a lecture and seminar format.

**Learner Outcomes or Objectives**

This course is designed to enable students to do the following:

1. Demonstrate knowledge about the pathophysiology, diagnosis and treatment of the major chronic diseases and conditions.
2. Understand how special populations respond to acute and chronic exercise.
3. Design appropriate exercise programs for individuals with chronic diseases and conditions.

**Professional Standards** (Commission on Accreditation of Allied Health Education Programs (CAAHEP))

Upon completion of this course, students will have met the following professional standards:

<b>Knowledge-Skill-Ability</b>	<b>Description</b>	<b>Lecture, Lab, or both</b>
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<b>(KSA)</b>		
	<b>GENERAL POPULATION/CORE: EXERCISE PHYSIOLOGY AND RELATED EXERCISE SCIENCE</b>	
1.1.34	Knowledge of and ability to describe the changes that occur in maturation from childhood to adulthood for the following: skeletal muscle, bone, reaction time, coordination, posture, heat and cold tolerance, maximal oxygen consumption, strength, flexibility, body composition, resting and maximal heart rate, and resting and maximal blood pressure.	Lecture
1.1.35	Knowledge of the effect of the aging process on the musculoskeletal and cardiovascular structure and function at rest, during exercise, and during recovery.	Lecture
	<b>GENERAL POPULATION/CORE: PATHOPHYSIOLOGY AND RISK FACTORS</b>	
1.2.1	Knowledge of the physiological and metabolic responses to exercise associated with chronic disease (heart disease, hypertension, diabetes mellitus, and pulmonary disease).	Lecture
1.2.3	Knowledge of risk factors that may be favorably modified by physical activity habits.	Lecture
1.2.4	Knowledge to define the following terms: total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C), TC/HDL-C ratio, low-density lipoprotein cholesterol (LDL-C), triglycerides, hypertension, and atherosclerosis.	Lecture
1.2.5	Knowledge of plasma cholesterol levels for adults as recommended by the National Cholesterol Education Program.	Lecture
1.2.6	Knowledge of the risk factor thresholds for ACSM risk stratification which includes genetic and lifestyle factors related to the development of CAD.	Lecture
1.2.7	Knowledge of the atherosclerotic process, the factors involved in its genesis and progression, and the potential role of exercise in treatment.	Lecture
1.2.8	Knowledge of how lifestyle factors, including nutrition and physical activity, influence lipid and lipoprotein profiles.	Lecture
	<b>GENERAL POPULATION/CORE: HEALTH APPRAISAL, FITNESS AND CLINICAL EXERCISE TESTING</b>	
1.3.22	Ability to modify protocols and procedures for cardiorespiratory fitness tests in children, adolescents, and older adults.	Lecture
	<b>GENERAL POPULATION/CORE: ELECTROCARDIOGRAPHY AND DIAGNOSTIC TECHNIQUES</b>	
1.4.1	Knowledge of how each of the following arrhythmias differs from the normal condition: premature atrial contractions and premature ventricular contractions.	Lecture
1.4.3	Knowledge of the basic properties of cardiac muscle and the normal pathways of conduction in the heart.	Lecture
	<b>GENERAL POPULATION/CORE:</b>	

	<b>PATIENT MANAGEMENT AND MEDICATIONS</b>	
1.5.1	Knowledge of common drugs from each of the following classes of medications and describe the principal action and the effects on exercise testing and prescription including antianginals; antihypertensives; antiarrhythmics; anticoagulants, bronchodilators; hypoglycemics; psychotropics; and vasodilators.	Lecture
1.5.2	Knowledge of the effects of the following substances on the exercise response such as antihistamines, tranquilizers, alcohol, diet pills, cold tablets, caffeine, and nicotine.	Lecture
	<b>GENERAL POPULATION/CORE EXERCISE PRESCRIPTION AND PROGRAMMING</b>	
1.7.2	Knowledge of the benefits and precautions associated with exercise training in apparently healthy and controlled disease.	Lecture
1.7.7	Knowledge of and ability to describe the unique adaptations to exercise training in children, adolescents, and older participants with regard to strength, functional capacity, and motor skills.	Lecture
1.7.8	Knowledge of common orthopedic and cardiovascular considerations for older participants and the ability to describe modifications in exercise prescription that are indicated.	Lecture
1.7.22	Skill to teach and demonstrate appropriate modifications in specific exercises for groups such as older adults, pregnant and postnatal women, obese persons, and persons with low back pain.	Lecture
1.7.26	Ability to describe modifications in exercise prescriptions for individuals with functional disabilities and musculoskeletal injuries.	Lecture
1.7.34	Ability to modify exercises based on age, physical condition and cognitive status.	Lecture
1.7.40	Ability to explain and implement exercise prescription guidelines for apparently healthy clients, increased risk clients, and clients with controlled disease.	Lecture
1.7.41	Ability to adapt frequency, intensity, duration, mode, progression, level of supervision, and monitoring techniques in exercise programs for patients with controlled chronic disease (e.g., heart disease, diabetes mellitus, obesity, hypertension), musculoskeletal problems (including fatigue), pregnancy and/or postpartum, and exercise-induced asthma.	Lecture
1.7.46	Ability to modify exercise programs based on age, physical condition, and current health status.	Lecture
	<b>GENERAL POPULATION/CORE: HUMAN BEHAVIOR AND COUNSELING</b>	
1.9.7	Knowledge of signs and symptoms of mental health states (e.g., anxiety, depression, eating disorders) that may necessitate referral to a medical or mental health professional.	Lecture
	<b>GENERAL POPULATION/CORE: SAFETY, INJURY PREVENTION, AND EMERGENCY PROCEDURES</b>	
1.10.11	Knowledge of potential musculoskeletal injuries (e.g., contusions, sprains, strains, fractures), cardiovascular/pulmonary complications	Lecture

	(e.g., tachycardia, bradycardia, hypotension/hypertension, tachypnea) and metabolic abnormalities (e.g., fainting/syncope, hypoglycemia/hyperglycemia, hypothermia/hyperthermia).	
1.10.15	Skill to demonstrate exercises used for people with low back pain, neck, shoulder, elbow, wrist, hip, knee and/or ankle pain; and the ability to modify a program for people with these conditions.	Lecture
	<b>GENERAL POPULATION/CORE: PROGRAM ADMINISTRATION, QUALITY ASSURANCE, AND OUTCOME ASSESSMENT</b>	
1.11.2	Knowledge of and the ability to use the documentation required when a client shows signs or symptoms during an exercise session and should be referred to a physician.	Lecture
	<b>CARDIOVASCULAR: PATHOPHYSIOLOGY AND RISK FACTORS</b>	
2.2.2	Knowledge of the pathophysiology of myocardial ischemia and infarction.	Lecture
2.2.3	Knowledge the pathophysiology of stroke, hypertension, and hyperlipidemia.	Lecture
2.2.4	Knowledge the effects of the above diseases and conditions on the cardiorespiratory responses at rest and during exercise.	Lecture
	<b>PULMONARY: PATHOPHYSIOLOGY AND RISK FACTORS</b>	
3.2.1	Knowledge of pulmonary risk factors or conditions that may require consultation with medical personnel before testing or training, including asthma, exercise-induced asthma/bronchospasm, extreme breathlessness at rest or during exercise, bronchitis, and emphysema.	Lecture
	<b>METABOLIC: PATHOPHYSIOLOGY AND RISK FACTORS</b>	
4.2.1	Knowledge of metabolic risk factors or conditions that may require consultation with medical personnel before testing or training, including obesity, metabolic syndrome, thyroid disease, kidney disease, diabetes or glucose intolerance, and hypoglycemia.	Lecture
	<b>ORTHOPEDIC/MUSCULOSKELETAL: PATHOPHYSIOLOGY AND RISK FACTORS</b>	
5.2.1	Knowledge of musculoskeletal risk factors or conditions that may require consultation with medical personnel before testing or training, including acute or chronic back pain, osteoarthritis, rheumatoid arthritis, osteoporosis, inflammation/pain, and low back pain.	Lecture
	<b>NEUROMUSCULAR: PATHOPHYSIOLOGY AND RISK FACTORS</b>	
6.2.1	Knowledge of neuromuscular risk factors or conditions that may require consultation with medical personnel before testing or training, including spinal cord injuries and multiple sclerosis.	Lecture
	<b>IMMUNOLOGIC: PATHOPHYSIOLOGY AND RISK FACTORS</b>	
7.2.1	Knowledge of immunologic risk factors or conditions that may require consultation with medical personnel before testing or training, including AIDS and cancer.	Lecture

## Required Texts

Ehrman, J.K., Gordon, P.M., Vistch, P.S. & Keteytan, S.J. (2013). *Clinical Exercise Physiology*, 3<sup>rd</sup> Ed. Human Kinetics, Champaign, IL.

## Course Performance Evaluation

Students are expected to submit all assignments on time in the manner outlined by the instructor (e.g., Blackboard, Tk20, hard copy).

- **Assignments and Examinations**

Written Examinations (4) (55%)

*Exams will be T/F and multiple-choice. Each exam will cover approximate one quarter of the semester's material*

- Case Studies and Homework (8) (30%)

*Scenarios relating to specific diseases or conditions will be given with discussion questions to follow. Students will respond in paragraph form*

- Journal Article Review (10%)

*Students will write a report detailing a peer reviewed-research article related to exercise and a special population*

- **Other Requirements**

Professionalism (5%)

*Kinesiology students are expected to behave in a professional manner. Depending upon the setting professionalism may appear different, but typically consists of similar components. For undergraduate Kinesiology students in a classroom setting professionalism generally comprises the following components:*

**Attendance** – *Show up on time to class and pay attention. If you cannot attend a class for a legitimate reason please notify the instructor ahead of time. If you have to unexpectedly miss a class due to something out of your control, contact the instructor within 24 hours to notify them what happened and to see if there is anything you need to do to make up your absence.*

**Communication** – *When communicating with the instructor and classmates, either face-to-face or via the assigned George Mason University email address, students should address the other person appropriately, use appropriate language and maintain a pleasant demeanor.*

**Participation** – *Participate in class discussions and activities. Demonstrate that you have an interest in the subject matter.*

**Responsibility/Accountability** – *Professionals take responsibility for their actions and are accountable. This can occur at multiple levels but generally consists of completing assignments on time, submitting work that is of the appropriate quality, honoring commitments and owning up to mistakes.*

**Honesty/Integrity** – *Students are expected to be honest with the instructor, classmates and themselves. Professionals keep their word when committing to something and act in an ethical manner.*

**Self-Improvement/Self-awareness** – *One should be aware of their strengths/weaknesses and*

*constantly seek to improve. Professionals regularly seek out opportunities to increase their knowledge and improve their current skill set.*

- **Grading**

A = 94 – 100	B+ = 87 – 89	C+ = 77 – 79	D = 60 – 69
A- = 90 – 93	B = 84 – 86	C = 74 – 76	F = 0 – 59
	B- = 80 – 83	C- = 70 – 73	

### Professional Dispositions

Students are held to the standards of the George Mason University Honor Code. You are expected to attend all class sections, actively participate in class discussions, complete in-class exercises and fulfill all assignments. Assignments must be turned in at the beginning of class on the specified date due or **no credit will be given.**

### Class Schedule

Week	Topic	Reading/Assignment
1	Course Introduction Review of general exercise prescription guidelines	Chapter 1
2	What is Cardiac Rehab? Graded Exercise Testing	Chapter 5 The Debate over Licensure for the Clinical Exercise Physiologist Homework
3	Hypertension Acute Coronary Syndromes	Chapter 8 & 12 Chapter 8 Case Study
4	Revascularization Chronic Heart Failure	Chapter 13 & 14 Chapter 12 Case Study Chapter 14 Case Study
5	<b>Exam</b> , Cardiac Electrical Pathophysiology	Chapter 16
6	Dyslipidemia, Chronic Obstructive Pulmonary Disease	Chapter 9 & 17
7	Chronic Obstructive Pulmonary Disease, Diabetes	Chapter 17 & 6
8	Diabetes, Metabolic Syndrome	Chapter 6 & 10 Chapter 6 Case Study
9	<b>Exam</b> , Obesity	Chapter 7
10	Arthritis, Osteoporosis	Chapter 22 & 23 Chapter 7 Case Study
11	Cancer, <b>Exam</b>	Chapter 20 Chapter 23 Case Study
12	Children, Aging	Chapter 29 & 30
13	Female Specific Issues, Stroke	Posted on Blackboard Chapter 28

14	Depression, <b>Exam</b>	Chapter 21 Chapter 28 Case Study
	Student Presentations-Tuesday, May 16th, 10:30am-1:15pm	Journal Article Review due

Note: Faculty reserves the right to alter the schedule as necessary, with notification to students.

## Core Values Commitment

The College of Education and Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles: <http://cehd.gmu.edu/values/>.

## GMU Policies and Resources for Students

### *Policies*

- Students must adhere to the guidelines of the University Honor Code (see <http://oai.gmu.edu/the-mason-honor-code/>).
- Students must follow the university policy for Responsible Use of Computing (see <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>).
- Students are responsible for the content of university communications sent to their Mason email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students **solely** through their Mason email account.
- Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see <http://ods.gmu.edu/>).
- Students must follow the university policy stating that all sound emitting devices shall be silenced during class unless otherwise authorized by the instructor.

### *Campus Resources*

- Support for submission of assignments to Tk20 should be directed to [tk20help@gmu.edu](mailto:tk20help@gmu.edu) or <https://cehd.gmu.edu/aero/tk20>. Questions or concerns regarding use of Blackboard should be directed to <http://coursessupport.gmu.edu/>.
- The Writing Center provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing (see <http://writingcenter.gmu.edu/>).
- The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide

range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance (see <http://caps.gmu.edu/>).

- The Student Support & Advocacy Center staff helps students develop and maintain healthy lifestyles through confidential one-on-one support as well as through interactive programs and resources. Some of the topics they address are healthy relationships, stress management, nutrition, sexual assault, drug and alcohol use, and sexual health (see <http://ssac.gmu.edu/>). Students in need of these services may contact the office by phone at 703-993-3686. Concerned students, faculty and staff may also make a referral to express concern for the safety or well-being of a Mason student or the community by going to <http://ssac.gmu.edu/make-a-referral/>.

**For additional information on the College of Education and Human Development, please visit our website <https://cehd.gmu.edu/>.**