

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

KINE 380.003 - Exercise Prescription and Programming for Special Populations  
3 Credits, Fall 2019  
Tuesday 7.20-10pm, West 1001, Fairfax Campus

**Faculty**

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**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:

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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))

**GENERAL POPULATION/CORE: EXERCISE PHYSIOLOGY AND RELATED EXERCISE SCIENCE**

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.

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.

**GENERAL POPULATION/CORE: PATHOPHYSIOLOGY AND RISK FACTORS**

1.2.1 Knowledge of the physiological and metabolic responses to exercise associated with chronic disease (heart disease, hypertension, diabetes mellitus, and pulmonary disease).

1.2.3 Knowledge of risk factors that may be favorably modified by physical activity habits.

1.2.4 Knowledge to define the following terms: total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C), TC/HDL-C ratio, lowdensity lipoprotein cholesterol (LDL-C), triglycerides, hypertension, and atherosclerosis.

1.2.5 Knowledge of plasma cholesterol levels for adults as recommended by the National Cholesterol Education Program.

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.

1.2.7 Knowledge of the atherosclerotic process, the factors involved in its genesis and progression, and the potential role of exercise in treatment.

1.2.8 Knowledge of how lifestyle factors, including nutrition and physical activity, influence lipid and lipoprotein profiles.

**GENERAL POPULATION/CORE: HEALTH APPRAISAL, FITNESS AND CLINICAL EXERCISE TESTING**

1.3.22 Ability to modify protocols and procedures for cardiorespiratory fitness tests in children, adolescents, and older adults.

**GENERAL POPULATION/CORE: ELECTROCARDIOGRAPHY AND DIAGNOSTIC TECHNIQUES**

1.4.1 Knowledge of how each of the following arrhythmias differs from the normal condition: premature atrial contractions and premature ventricular contractions.

1.4.3 Knowledge of the basic properties of cardiac muscle and the normal pathways of conduction in the heart.

**GENERAL POPULATION/CORE: PATIENT MANAGEMENT AND MEDICATIONS**

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.

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.

## **GENERAL POPULATION/CORE EXERCISE PRESCRIPTION AND PROGRAMMING**

1.7.2 Knowledge of the benefits and precautions associated with exercise training in apparently healthy and controlled disease.

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.

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.

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.

1.7.26 Ability to describe modifications in exercise prescriptions for individuals with functional disabilities and musculoskeletal injuries.

1.7.34 Ability to modify exercises based on age, physical condition and cognitive status.

1.7.40 Ability to explain and implement exercise prescription guidelines for apparently healthy clients, increased risk clients, and clients with controlled disease.

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.

1.7.46 Ability to modify exercise programs based on age, physical condition, and current health status.

## **GENERAL POPULATION/CORE: HUMAN BEHAVIOR AND COUNSELING**

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.

## **GENERAL POPULATION/CORE: SAFETY, INJURY PREVENTION, AND EMERGENCY PROCEDURES**

1.10.11 Knowledge of potential musculoskeletal injuries (e.g., contusions, sprains, strains, fractures), cardiovascular/pulmonary complications (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.

## **GENERAL POPULATION/CORE: PROGRAM ADMINISTRATION, QUALITY ASSURANCE, AND OUTCOME ASSESSMENT**

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.

## **CARDIOVASCULAR: PATHOPHYSIOLOGY AND RISK FACTORS**

- 2.2.2 Knowledge of the pathophysiology of myocardial ischemia and infarction.
- 2.2.3 Knowledge the pathophysiology of stroke, hypertension, and hyperlipidemia.
- 2.2.4 Knowledge the effects of the above diseases and conditions on the cardiorespiratory responses at rest and during exercise.

### **PULMONARY: PATHOPHYSIOLOGY AND RISK FACTORS**

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.

### **METABOLIC: PATHOPHYSIOLOGY AND RISK FACTORS**

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.

### **ORTHOPEDIC/MUSCULOSKELETAL: PATHOPHYSIOLOGY AND RISK FACTORS**

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.

### **NEUROMUSCULAR: PATHOPHYSIOLOGY AND RISK FACTORS**

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.

### **IMMUNOLOGIC: PATHOPHYSIOLOGY AND RISK FACTORS**

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.

### **Required Texts**

Ehrman, J.K., Gordon, P.M., Vistch, P.S. & Keteytan, S.J. (2013). Clinical Exercise Physiology, 4<sup>th</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/or 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	

*Final letter grades do not round up. For example, a final percentage of 89.99% will result in a B+.*

## Professional Dispositions

See <https://cehd.gmu.edu/students/polices-procedures/>

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/date	Topic	Reading assignment	Assignment DUE
1. 8/27/2019	No Class-meeting scheduled		
2. 9/3/2019	Course Introduction Review of General Exercise prescription Guidelines	Chapter 1	
3. 9/10/2019	Cardiac Rehabilitation Graded Exercise Testing	Chapter 5 The Debate over Licensure for the CEP	Debate over Licensure
4. 9/17/2019	Hypertension Acute Coronary Syndromes	Chapter 9 & 13	
5. 9/24/2019	Revascularization Chronic Heart Failure	Chapter 14 & 15	Ch 9& 13 Case Study (HTN & ACS)
6. 10/1/2019	<b>Exam 1</b> Chronic Obstructive Pulmonary Disease	Chapter 18	Ch 15 Case Study (CHF)
7. 10/8/2019	Cardiac Electrical Pathophysiology Dyslipidemia	Chapter 10 & 17	
8. 10/15/2019	<b>Fall Break-No Class</b>		
9. 10/22/2019	Diabetes Metabolic Syndrome	Chapter 7 & 11	
10. 10/29/2019	<b>Exam 2</b> Obesity Cancer	Chapter 8 & 21	Ch 7 Case Study (Diabetes)
11. 11/5/2019	Osteoporosis Arthritis	Chapter 23 & 24	Ch 8 Case Study (Obesity)
12. 11/12/2019	<b>Exam 3</b> Stroke	Chapter 29	Ch 24 (Osteoporosis) Case Study
13. 11/19/2019	Children Aging	Chapter 31&32	
14. 11/26/2019	Female Specific Issues Depression	Chapter 33	
15. 12/3/2019	<b>Exam 4</b>		
16. 12/10/2019	<b>Exam Break – No Class</b>		
17. 12/17/2019	<b>Student Poster presentations</b>		Final Paper

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 Mason 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/>.
- For information on student support resources on campus, see <https://ctfe.gmu.edu/teaching/student-support-resources-on-campus>

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

