Texas A&M University-Corpus Christi
Physiology of Exercise

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KINE 4312.01
Meeting Times: MWF 1100 - 1150

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I. COURSE DESCRIPTION

(KINE 4312.01, Physiology of Exercise) Provide the student with knowledge of the physiological changes and residues of exercise with emphasis on muscular analysis and practical applications for conditioning and therapeutic exercises.

Prerequisites: 1. Requires Department Approval; 2. Prerequisite course required-BIOL2401 or Prerequisite course required-KINE2325 and Prerequisite course required-KINE1320 or Prerequisite course required-KINE2313 and Prerequisite/Co-Requisite course required-KINE4112;

Note: Grades in this course are not related to, nor are they affected by grades in KINE 4112, Physiology of Exercise Lab.

II. RATIONALE

The primary goal of this class is to acquaint students with a basic working-knowledge, understanding, and value of the study of physical exercise as related to fitness and performance.

III. STATE ADPOTED PROFICIENCIES FOR TEACHERS AND/OR ADMINISTRATORS/COUNSELORS

A. LEARNER-CENTERED KNOWLEDGE: The teacher possesses and draws on a rich knowledge base of content, pedagogy, and technology to provide relevant and meaningful learning experiences for all students.

B. LEARNER-CENTERED INSTRUCTION: To create a learner-centered community, the teacher collaboratively identifies needs; and plans, implements, and assesses instruction using technology and other resources.

C. EQUITY IN EXCELLENCE FOR ALL LEARNERS: The teacher responds appropriately to diverse groups of learners.
D. LEARNER-CENTERED COMMUNICATION: While acting as an advocate for all students and the school, the teacher demonstrates effective professional and interpersonal communication skills.

E. LEARNER-CENTERED PROFESSIONAL DEVELOPMENT: The teacher, as a reflective practitioner dedicated to all students’ success, demonstrates a commitment to learn, to improve the profession, and to maintain ethics and personal integrity.

IV. TeXeS COMPETENCIES & CAATE COMPETENCIES & PROFICIENCIES

A. TExES COMPETENCIES

Competency 002 - Physical education teacher applies principles and concepts of fitness and fitness development/maintenance to evaluate, select, and adapt activities that help learners achieve and maintain appropriate fitness levels.

Competency 003 - The teacher appreciates human diversity, recognizes how diversity in the classroom and the community may affect learning and creating a classroom environment in which both the diversity of groups and the uniqueness of individuals are recognized and celebrated.

Competency 004 - Fitness-related health, nutrition, and safety. The physical education teacher knows health, nutrition, and safety principles and practices related to fitness/performance and encourages learners to apply these principles and practices.

Competency 011 - Legal, ethical, medical, and safety issues. The physical education teacher understands legal, ethical, medical, and safety issues relating to physical education programs and applies this understanding in a variety of contexts.

B. NATIONAL COMPETENCIES & PROFICIENCIES FOR ATHLETIC TRAINING (CAATE 4th Ed.)

Risk Management Competencies Instructed & Evaluated

- **RM-C1**: Explain the risk factors associated with physical activity.
- **RM-C2**: Identify and explain the risk factors associated with common congenital and acquired abnormalities, disabilities, and diseases.
- **RM-C3**: Identify and explain the epidemiology data related to the risk of injury and illness related to participation in physical activity.
- **RM-C4**: Identify and explain the recommended or required components of a preparticipation examination based on appropriate authorities' rules, guidelines, and/or recommendations.
- **RM-C5**: Describe the basic concepts and practice of wellness screening.
- **RM-C6**: Describe the general principles of health maintenance and personal hygiene, including skin care, dental hygiene, sanitation, immunizations, avoidance of infectious and contagious diseases, diet, rest, exercise, and weight control.
• **RM-C9:** Explain the accepted guidelines, recommendations, and policy and position statements of applicable governing agencies related to activity during extreme weather conditions.

• **RM-C11:** Explain the importance and use of standard tests, test equipment, and testing protocol for the measurement of cardiovascular and respiratory fitness, body composition, posture, flexibility, muscular strength, power, and endurance.

• **RM-C12:** Explain the components and purpose of periodization within a physical conditioning program.

• **RM-C13:** Identify and explain the various types of flexibility, strength training, and cardiovascular conditioning programs. This should include the expected effects (the body’s anatomical and physiological adaptation), safety precautions, hazards, and contraindications of each.

• **RM-C14:** Explain the precautions and risks associated with exercise in special populations.

**Risk Management Proficiencies Instructed**

• **RM-P1:** Instruct the patient how to properly perform fitness tests to assess his or her physical status and readiness for physical activity. Interpret the results of these tests according to requirements established by appropriate governing agencies and/or a physician. These tests should assess:
  o **RM-P1.1:** Flexibility
  o **RM-P1.4:** Muscular Endurance
  o **RM-P1.6:** Cardiovascular Endurance

• **RM-P2:** Develop a fitness program appropriate to the patient’s needs and selected activity or activities that meet the requirements established by the appropriate governing agency and/or physician for enhancing:
  o **RM-P2.1:** Flexibility
  o **RM-P2.2:** Strength
  o **RM-P2.3:** Power
  o **RM-P2.4:** Muscular Endurance
  o **RM-P2.5:** Agility
  o **RM-P2.6:** Cardiovascular Endurance
  o **RM-P2.7:** Speed

**Risk Management Proficiencies Evaluated**

• **RM-CP1:** Plan, implement, evaluate, and modify a fitness program specific to the physical status of the patient. This will include instructing the patient in proper performance of the activities and the warning signs and symptoms of potential injury that may be sustained. Effective lines of communication shall be established to elicit and convey information about the patient’s status and the prescribed program. While maintaining patient confidentiality, all aspects of the fitness program shall be documented using standardized record-keeping methods.

**Pathology Competencies Instructed & Evaluated**

• **PA-C6:** Describe the body’s responses to physical exercise during common diseases, illnesses, and the injury.

**Diagnosis Competencies Instructed & Evaluated**

• **DI-C7:** Explain the relationship of injury assessment to the systematic observation of the person as a whole.
• DI-C13: Describe the use of diagnostic tests and imaging techniques based on their applicability in the assessment of an injury when prescribed by a physician.
• DI-C14: Describe the clinical signs and symptoms of environmental stress.

Medical Conditions Competencies Instructed & Evaluated

• MC-C1: Describe and know when to refer common congenital or acquired abnormalities, physical disabilities, and diseases affecting people who engage in physical activity throughout their life span (e.g., arthritis, diabetes).
• MC-C2: Understand the effects of common illnesses and diseases in physical activity.

Medical Conditions Proficiencies Instructed

• MC-P4: Apply commonly used special tests and instruments (e.g., otoscope, stethoscope, ophthalmoscope, peak flowmeter, chemical “dipsticks” [or similar devices]) and document the results for the assessment of:
  o MC-P4a: Vital signs including respiration (including asthma), pulse and circulation, and blood pressure.

Exercise Competencies Instructed & Evaluated

• EX-C4: Describe the appropriate selection and application of therapeutic exercises taking the following into consideration:
  o EX-C4b: The physiological effects of inactivity and immobilization on the musculoskeletal, cardiovascular, nervous, and respiratory systems of the human body.
  o EX-C4e: The physiological responses of additional factors, such as age and disease.
• EX-C7b: Interpret objective measurement results (muscular strength/endurance, range of motion) as a basis for developing an individualized therapeutic exercise program.

Nutritional Aspects Competencies Instructed & Evaluated

• NU-C1: Describe personal health habits and their role in enhancing performance, preventing injury or illness, and maintaining a healthy lifestyle.
• NU-C3: Identify and describe primary national organizations responsible for public and professional nutritional information.
• NU-C4: Identify nutritional considerations in rehabilitation, including nutrients involved in healing and nutritional risk factors (e.g., reduced activity with the same dietary regimen and others).
• NU-C5: Describe common illnesses and injuries that are attributed to poor nutrition (e.g., effects of poor dietary habits on bone loss, on injury, on long-term health, and on other factors).
• NU-C15: Identify effects of macronutrients (e.g., saturated fats, incomplete proteins, and complex carbohydrates) on performance, health, and disease.
• NU-C18: Describe the principles and methods of body composition assessment (e.g., skinfold calipers, bioelectric impedance, body mass index [BMI]) to assess a patient’s health status and to monitor progress in a weight loss or weight gain program for patients of all ages and in a variety of settings.

Nutritional Aspects Proficiencies Taught
• **NU-P1**: Assess body composition by validated technique (e.g., skinfold calipers, bioelectric impedance, BMI, etc.) to assess a patient’s health status and to monitor progress during a weight loss or weight gain program.

• **NU-P2**: Calculate energy expenditure, caloric intake, and BMR.

V. **COURSE OBJECTIVES/LEARNING OUTCOMES**

Given lectures, discussions, videos and/or field experiences, the student will be able to;

A. Demonstrate knowledge of the structure and function of the body as it relates to physical activity.

B. Demonstrate knowledge of the integrative nature of the physiological systems under the stress of exercise

C. State representative values of the various body systems at rest, submaximal exercise, and maximal exertion.

D. Identify functional changes in response to a session of exercise.

E. Identify laboratory procedures with respect to exercise physiology.

F. Identify the scientific body of knowledge in exercise physiology.

VI. **COURSE TOPICS (some topics may change as course progresses)**

The major topics to be considered are:

A. energy systems relationship to exercise and training;

B. carbohydrate, protein and fat breakdown and utilization;

C. neuromuscular physiology and adaptations to exercise and training;

D. mechanisms of muscular strength, hypertrophy, endurance, and power;

E. cardiovascular physiology and adaptations to exercise and training;

F. mechanisms of cardiovascular adaptations;

G. maximal oxygen uptake and adaptations to training;

H. acid base balance and adaptations to training;

I. valsalva maneuver;

J. methods of determining nutritional needs in response to exercise;
K. nutritional needs before, during, and after exercise to accommodate exercise and training adaptations;

L. the science and practice of body composition

VII. INSTRUCTIONAL METHODS AND ACTIVITIES

A. Traditional lecture via power point, classroom discussion, independent learning, and online instruction/readings.

B. Classroom participation activities

VIII. EVALUATION AND GRADE ASSIGNMENT

The method of evaluation and the criteria for grade assignment are:

A. Requirements and point values. The total number of quizzes and in-class point opportunities are tentative. Therefore, the point values listed may vary.

- Quizzes, approximately 7-10 at 10 pts each*  | 100 points
- Tests, 3 at 100 pts, one at 160 pts. * | 460 points
- Get your head in the book assignments.* | 60 points

The final test, at 160 pts. is cumulative.

Get Your Head In The Book Assignments are study assignments (15-20 questions each) in which the student will answer provided study questions to enhance learning, research skills, and test preparation.

*Points, test values, and numbers of assignments may be altered to best reflect the needs of the class.

B. Grading Scale:

- 90-100% = A
- 80-89% = B
- 70-79% = C
- 60-69% = D
- 59% and below = F

NOTE REGARDING YOUR GRADES: At the end of the semester, I will not even consider rounding up your grade or passing you on a close grade unless you have done the following: a) seen me (in person) for help on a regular basis, b) completed all point opportunities, and c) bothered to ask questions regularly in class.

NOTE REGARDING QUALITY OF YOUR WORK: If any work done on behalf of this class is not performed at a standard expected of a junior or senior in college, it either will not be graded or it will be severely penalized. I will not give partial credit for a partially completed assignment, a sloppy assignment, an assignment that was obviously completed in a big hurry
to beat a deadline, or because you didn’t read the instructions. You will simply receive a zero. These assignments will not be allowed to be made up once the grade is assigned. You can avoid this problem by simply doing a quality job the first time and planning ahead. For class quizzes, which will be done at the beginning of class, your writing must be legible. If I can’t read something, it is wrong.

NOTE REGARDING SUBMISSION OF YOUR ASSIGNMENTS: All work in this class is to be submitted as an attached word document unless otherwise specified. It is your burden to work with the instructor during the first assignment to get your format correct and then use it consistently throughout the semester. Word Perfect (.wps) files, some Mac formats, and the newest Windows programs do not open on most university computers. We currently use Windows 2007. It is your job to save your documents in a format that can be opened by the instructor.

IX. COURSE SCHEDULE AND POLICIES

Note: course and test schedules may be altered to best fit the schedule and the class schedule.

A. If you forgotten the professor's name, office, phone, class meeting place and office hours, they are located at the beginning of the syllabus.

Unit I:

Weeks 1-3

Introduction

Chapter 2: Fuel for Exercising Muscle: Metabolism and Hormonal Control

Chapter 10: Adaptations to Anaerobic Training, Pages 272-277

Weeks 4-6

Chapter 3: Neural Control of Exercising Muscle 73-77, 80-87

Chapter 1: Structure and Function of Exercising Muscle

Chapter 10: Adaptations to Resistance Training

Chapters10 & 5: Soreness, 237-240; Fatigue, 128-134

Test # 1

Unit 2:

Weeks 7-8

Chapter 6: The Cardiovascular System and Its Control

Weeks 8-9
Weeks 10-11

Chapter 7: The Respiratory System and Its Regulation
Chapter 4: Respiratory Exchange Ratio, Pages 117-118

Test # 2

Unit 3:

Weeks 11-12

Chapter 15: Body Composition and Nutrition For Sport, Pages 355-367

Weeks 12-13

Chapter 9: Principles of Exercise Training
Chapter 10: Specificity of Training and Cross-Training, Page 275-277
Chapter 13: Overtraining 338-346

Weeks 14-15

Chapter 16: Ergogenic Aids and Sport
Chapter 15: Glycemic Index 369—370, CHO Loading 370-372

Test # 3 - LAST REGULAR DAY OF CLASS!

Don’t be afraid to use the index in the book and search around for needed information.

Test # 4: Final Cumulative Exam (on scheduled date during finals week or specified date)

B. Class Policies

1. Lack of attendance, for any reason (legit or not), can hurt your grade. There is no credit for coming to class. If you must be absent or do have a conflict, take responsibility for yourself for all missed materials by obtaining notes and making arrangements as needed.

2. The highest level of professional decorum is expected in the classroom. Please conduct yourself accordingly. If you are tired and feel like sleeping, please stand and take your notes to the side of the class or excuse yourself if you must.
3. Please turn off your cell phones in class. Should you have a pending emergency, please tell me if you must leave it on. If you text message or send emails in class (computer, phone, or otherwise) I will ask you to leave. If you don’t or do it again, I will have you removed from the class. You may not use cell phones or cell-phone calculators on any exams or quizzes.

4. You may not use a computer in class for anything other than taking notes. If you are not using the computers in the classroom for note-taking, please push them down into the desk. Use of computers for any other function during class will be considered disruptive. If you are one of those people who like taking notes on the computer during class and surfing elsewhere between notes, please cease this practice.

5. While most people know smoking is not allowed in class, too many haven’t figured out that smokeless tobacco is not allowed either, as per university policies. No smokeless tobacco in class. While not currently addressed by university policy, I do not allow the use of mechanical cigarettes in class, even if they only emit water vapor.

**Tests, Quizzes, and Assignments**

A. In order to get you to class and to keep you sharp, quizzes will be given regularly at the beginning of class. Yes, this is how I keep you coming to class and consistently preparing. If you miss class or are late on a regular basis you will soon find yourself in grade trouble. I don’t allow make ups on these quizzes unless the University has issued an excused absence for you.

B. Tests will be taken on the designated or arranged test dates and times only, no last-minute reschedules. Late tests will not be allowed unless prior arrangements are made. Tests taken with testing services should be arranged well in advance of exams.

C. Any class assignments will be sent as documents over Blackboard and on-time. No assignment will be written or copied into the submission box on Blackboard, no matter what any other instructor in your past has done.

**X. TEXTBOOK**


I ENCOURAGE YOU TO SAVE MONEY BY USING THE "E-BOOK" VERSION OF THIS TEXT OR USING THE 3RD EDITION OF THIS TEXT!

Book Link:


E-Book Link: Place the order and instructions will be given on how to download.
You may also choose the previous (4th edition) text for this class if it saves you some money. I will submit though that some newer items may not be covered in this text. Choose wisely.

XI. BIBLIOGRAPHY


XII. GRADE APPEALS

As stated in University Rule 13.02.99.C2, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university_rules/index.html. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

Academic Honesty

University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, forgery, or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.)

Disciplinary action for academic misconduct is the responsibility of the faculty member assigned to the course. The faculty member is charged with assessing the gravity of any case of academic dishonesty, and with giving sanction to any student involved. Penalties that may be applied to individual cases of academic dishonesty include one or more of the following:

A. Written reprimand;
B. Requirement to re-do work in question;

C. Requirement to submit additional work;

D. Lowering of grade on work in question;

E. Assigning grade of “F” to work in question;

F. Assigning grade of “F” for course;

G. Recommendation for more severe punishment.

If the faculty member determines that assigning a grade of “F” to the course is the appropriate penalty and this disciplinary action occurs prior to the deadline for dropping courses, the student forfeits his/her right to drop the course in question.

The faculty member may file a record of cases of academic dishonesty, including a description of the disciplinary action taken, along with any materials involved, with his or her college dean and the Office of Student Affairs. The office of the academic dean of the college in which the offense took place will maintain records of all cases of academic dishonesty reported for a period of not more than two years. Any student who has been penalized for academic dishonesty has the right to appeal the judgment or the penalty assessed (See XII above).

What is also considered dishonest with reference to this class?

A. using an assignment from a previous semester, no matter where it came from, to produce your own (my electronic checker will catch this)

B. file swapping with a partner to produce your work, loaning your work to another person to "model" as the borrower may take more than you think putting you both in trouble

C. failure to properly cite resources in your lab report or assignments

D. using any form of outside help other than your mind on any test or quiz, calculators without Internet or note-taking capabilities might be allowed at the professor’s discretion.

E. unethically obtaining copies of exams etc.

F. photographing or copying ANY quiz or test materials for any purpose with ANY device

G. anything else that falls under the umbrella of dishonest conduct that common sense would dictate as unethical
XIII. DISABILITIES AND ACCOMMODATIONS

Americans with Disabilities Act (ADA) - The ADA is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disability. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Driftwood 101.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.