

Las Positas College  
3000 Campus Hill Drive  
Livermore, CA 94551-7650  
(925) 424-1000  
(925) 443-0742 (Fax)

**Course Outline for KIN 28**  
**COMP OF FITNESS-HUMAN BODY**  
**Effective: Fall 2004**

**I. CATALOG DESCRIPTION:**

KIN 28 — COMP OF FITNESS-HUMAN BODY — 3.00 units

Introduction to the science of exercise including basic anatomy, exercise physiology, kinesiology, body mechanics, and nutrition. Applied principles of exercise science including physical fitness assessment, exercise program design, body composition assessment, and professionalism in the fitness field.

3.00 Units Lecture

**Grading Methods:**

**Discipline:**

	<b>MIN</b>
<b>Lecture Hours:</b>	54.00
<b>Total Hours:</b>	54.00

**II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1**

**III. PREREQUISITE AND/OR ADVISORY SKILLS:**

**IV. MEASURABLE OBJECTIVES:**

**Upon completion of this course, the student should be able to:**

- A. Explain the benefits of regular exercise;
- B. Identify and describe the structures, functions, capabilities, and needs of the human body during physical activity;
- C. Describe the components of physical fitness, including cardiorespiratory endurance, muscle endurance, muscle strength, flexibility and body composition;
- D. Describe methods of assessment available for each component of fitness;
- E. Demonstrate professional assessment protocols for each of the components of physical fitness;
- F. Discuss the limitations of each method of assessment;
- G. Interpret assessment findings and compare/contrast those findings to established norms;
- H. Design a safe and effective exercise program that meets the needs of the program participant;
- I. Identify nutrients and non-nutrients, and explain how they support physical activity and health;
- J. Identify, access, and interpret peer-viewed exercise science literature.

**V. CONTENT:**

- A. Exercise and Health
  1. Longevity and quality of life
  2. Health benefits of regular physical activity
  3. Potential risks of exercise
    - a. Pre-exercise screenings
      1. Resting heart rate, blood pressure, health history questionnaires, medical clearance, Par-Q readiness, etc...
- B. The Science of Exercise
  1. The scientific process
  2. Scientific tools and laboratory reports
    - a. Introduction
    - b. Purpose
    - c. Methods/Materials
    - d. Data
    - e. Analysis
    - f. Conclusions and Discussion
  3. Experimental validity
    - a. Internal validity, external validity, generalizability
  4. Putting theory into practice in the real world
  5. Exercise science peer-reviewed journals
- C. Components of Physical Fitness
  1. Cardiorespiratory endurance
  2. Muscle strength
  3. Muscle endurance
  4. Flexibility
  5. Body composition
- D. Exercise for health and wellness

- E. Training for sport and competition
  - 1. Power
  - 2. Speed
  - 3. Agility
  - 4. Stability
  - 5. Balance
  - 6. Advanced training techniques
    - a. Power training, jumping, and plyometrics
- F. Principles of exercise training
  - 1. Overload
  - 2. Specificity
  - 3. Frequency
  - 4. Intensity
  - 5. Time (duration)
  - 6. Type (mode)
- G. Cardiorespiratory Endurance
  - 1. Anatomy and physiology of the cardiovascular system
    - a. Cardiac function, circulation, blood, pulmonary function
  - 2. Exercise Metabolism
    - a. Anaerobic and aerobic metabolism
    - b. Immediate energy system
    - c. Lactic acid system
    - d. Oxygen system
  - 3. Factors affecting performance
  - 4. Assessment protocols
    - a. Safety concerns and contraindications
    - b. Graded exercise testing
    - c. Treadmill tests
    - d. Step tests
    - e. Bicycle ergometer testing
    - f. Walk/run tests
    - g. Designing a training program
    - h. Endurance, power, speed, specificity of training
- H. Muscle Strength and Endurance
  - 1. Anatomy and physiology of the Skeletal System
    - a. Bone
    - b. Articulations and joints
    - c. Muscle attachments
    - d. Anatomical planes and axes
    - e. Biomechanics
  - 2. Anatomy and physiology of the Muscular System
    - a. Structure of skeletal muscle
      - 1. Actin, myosin, sliding filament theory
    - b. The Motor Unit
  - 3. Assessment protocols
    - a. Safety concerns and contraindications
    - b. 1 Rep Max
    - c. 10 Rep Max
    - d. Chest press tests
    - e. Leg press tests
    - f. Push-up test
    - g. Curl-up test
  - 4. Designing a training program for muscle strength, endurance, power
- I. Flexibility
  - 1. What determines flexibility?
  - 2. Types of stretching techniques
    - a. Static
    - b. Ballistic
    - c. PNF
  - 3. Benefits of flexibility and stretching
  - 4. Basic stretching exercises and designing a stretching routine
- J. Body Composition
  - 1. Lean body mass and types of body fat
  - 2. Health implications of excess body fat
  - 3. Assessment techniques and protocols
    - a. Bioelectrical impedance
    - b. Calipers
    - c. Infrared
    - d. Hydrostatic weighing
    - e. DEXA
  - 4. Concerns and limitations of various assessment techniques
- K. Nutrition
  - 1. Essential nutrients and non-nutrients
  - 2. A healthy, high-performance diet
  - 3. Ergogenic aids and supplements
- L. Designing an Exercise Program
  - 1. Principles of program design
  - 2. Utilizing assessment results
  - 3. Safe and effective programs that meet the needs of the participant

## VI. METHODS OF INSTRUCTION:

- A. **Discussion** -
- B. Audio/visual presentations
- C. **Lecture** -
- D. Class projects
- E. Demonstration of and participation in assessment protocols
- F. Small group activities

## VII. TYPICAL ASSIGNMENTS:

A. Reading 1. Read the U.S. Surgeon General's Report on Physical Fitness. Be prepared to discuss current physical fitness trends in the United States and strategies for improvement fitness status of Americans. B. Writing 1. Describe the major modifiable risk factors for cardiovascular disease and the role that regular physical exercise can play in reducing those risks. C. Critical thinking and problem-solving 1. After reviewing the readings, lecture/discussion notes on Pre-Exercise Screenings, and the American College of Sports Medicine Guidelines for Exercise Testing, describe what precautions and assessments you would consider for a 45 year old male in apparently good health. D. Small group activity/demonstration 1. Working in groups of three, you will role play as 1 exercise program participant and 2 exercise/fitness professionals to complete a professional assessment protocol for graded treadmill testing. In administering the assessment, be sure to include the proper use of methods/materials, demonstration and cueing, and professionalism. When the assessment is concluded, prepare a written report to include: an introduction, purpose, methods/materials/protocol, data collected during assessment, analysis, and conclusions/discussion.

#### VIII. EVALUATION:

##### A. **Methods**

1. Papers
2. Oral Presentation
3. Class Participation
4. Other:
  - a. Methods
    1. Participation in class discussions
    2. Participation in class activities based on assigned readings, lecture/discussion.
      - a. Working in groups of three, you will role play as 1 exercise program participant and 2 exercise/fitness professionals to complete a professional assessment protocol for graded treadmill testing. In administering the assessment, be sure to include the proper use of methods/materials, demonstration and cueing, and professionalism.
    3. Written reports
      - a. Prepare a written laboratory report on Cardiorespiratory Endurance using the graded Treadmill Test results gathered during the class activity. The written report should include: an Introduction with background and purpose, Methods and Materials which accurately describe both the subject and the protocol used, Data collected during the assessment, Analysis of the results, and Conclusions and Discussion.
    4. Oral presentation of written reports
      - a. After you have read, understood, and written an abstract for an exercise science journal article, you will present the findings of the research article to your peers through a 5-10 minute oral presentation.

##### B. **Frequency**

1. Frequency
  - a. Weekly readings
  - b. Weekly activities completed during class time with follow-up writing assignments
  - c. 2-4 written essays/reports

#### IX. TYPICAL TEXTS:

1. American College of Sports Medicine *ACSM's Guidelines for Exercise Testing and Prescription*. 6th ed., -, 2000.
2. American College of Sports Medicine & Roitman EdD, FACSM *CSM's Resource Manual for Guidelines for Exercise Testing and Prescription*, -, 2001.
3. Fahey *Super Fitness for Sports, Conditioning, and Health*, Benjamin/Cummings, 2000.
4. Howley and Franks *Health Fitness Instructor's Handbook*. 4th ed., Human Kinetics, 2003.
5. LeMura PhD, FACSM & Von Duvillard PhD, FACSM *Clinical Exercise Physiology: Applications and Physiological Principles*, -, 2003.
6. Housh, Housh, & Johnson *Introduction to Exercise Science*. 2nd ed., Benjamin/Cummings, 2003.

#### X. OTHER MATERIALS REQUIRED OF STUDENTS:

- A. Exercise clothing and proper footwear for in-class activities/labs.