



Course Title: **Kinesiology for the Fitness Professional**

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Course Type: Home Study

Credit hours: IACET (International Association for Continuing Education and Training) 0.4 (4 Hours) Approved and Accepted by several additional organizations.

Marketing Description:

Increase your understanding and professionalism by expanding your knowledge in human movement. This course contains text, photos, interactive graphics, and video to help you deepen your knowledge for the fundamentals of human movement and the unique way each person moves. Make each exercise work for your clients. Develop your ability to effectively understand and modify exercises in order to personalize an exercise movement or routine.

Introduction:

**Definition:** Kinesiology is the branch of physiology that studies mechanics and anatomy in relation to human movement.

- Understanding the fundamentals of human movement is important to the health-fitness professional.
- The fundamentals of human movement are the same for each individual. However, each individual's body is unique (length of limbs, muscle attachments, muscle and tendon length, etc.). Therefore, movement is unique for each person.
- The health-fitness professional needs to have the ability to effectively understand and modify exercises to personalize an exercise routine. To achieve this, knowledge is needed in the areas of exercise anatomy and physiology.

Objectives:

**After completing this course you should be able to:**

- Differentiate between physical activity and exercise.
- Describe the benefits of cardiorespiratory exercise and resistance training.
- List and describe the 5 components of physical fitness.
- Explain the 6 principles of exercise training.
- List and discuss the ACSM guidelines for physical activity, cardiorespiratory, resistance, and flexibility training.
- Identify the major bones in the human skeleton, and discuss the structure of bone and how it is formed.
- Identify the major muscles in the human body, and discuss the 5 characteristics and structure of muscle, and describe 4 muscle actions.
- Identify 6 joint structures in the human body.
- Describe the 4 planes of motion and 3 axis of rotation in human movement.
- Identify and describe movement at the primary joints in the human body including the plane of movement, axis of rotation, and muscles used.

## Fast Track Course Outline:

- Basic Concepts of Exercise Physiology
  - Exercise and Physical Activity
  - Benefits of Physical Activity
  - Benefits of Cardiorespiratory Exercise
  - Benefits of Resistance Training
  - Components of Physical Fitness
    - Cardiorespiratory Endurance
    - Muscular Fitness
      - Muscular Strength
      - Muscular Endurance
      - Muscular Power
      - Muscular Hypertrophy
    - Flexibility
    - Body Composition
      - Body Comp 2
    - Skill Components
      - Skill Components 2
        - Balance
        - Coordination
        - Speed
        - Agility
        - Reaction Time
  - Principles of Exercise Training
    - Progressive Overload
    - Adaptation
    - Specificity
      - Specificity 2
    - Variability
    - Reversability
    - Individuality
  - ACSM Exercise Guidelines
    - Guidelines for Health-Related Physical Activity
    - Cardiovascular Exercise Guidelines
      - Cardiovascular Exercise Guidelines 2
      - Cardiovascular Exercise Guidelines 3
    - Resistance Training Guidelines
    - Flexibility Training Guidelines
      - Flexibility Training Guidelines 2
    - FITT Principle
- Review of Anatomy
  - Skeletal System
    - Display of Skeleton
    - Display of Upper Extremity
    - Display of Lower Extremity
    - Display of Spine
    - Display of General Features of Bone
    - Bone Formation
    - Bone Remodeling
    - Connective Tissue
      - Tendons
      - Ligaments
      - Cartilage
  - Review of the Muscle System

- Function & Characteristics of Muscle Tissue
- Muscle Structure
- Muscle Fiber Types
- Muscle Actions
- Types of Isotonic Actions
- Entire Body Musculature
- Abdominal Muscles
- Shoulder Muscles
- Thigh Muscles
- Motion of Joints
  - Joint Structures
    - Gliding Joint
    - Hinge Joint
    - Pivot Joint
    - Condylloid Joint
    - Saddle Joint
    - Ball and Socket
    - Joint Summary Chart
  - Planes of Motion
    - Frontal Plane
    - Saggital Plane
    - Transverse Plane
    - Diagonal Plane
  - Axis of Rotation
    - Frontal Axis
    - Sagittal Axis
    - Vertical Axis
    - Review Chart of Planes and Axis
  - Joint Motions
    - Flexion/Extension
      - Elbow
      - Knee
      - Shoulder
      - Hip
      - Neck
      - Wrist
      - Spine
    - Lateral Flexion/ Extension
      - Lateral Flexion - Lumbar Spine
    - Abduction/Adduction
      - Shoulder (Ball Joint) Frontal
      - Shoulder (Ball Joint) Transverse
      - Hip (Ball Joint) Frontal
      - Hip (Ball Joint) Transverse
      - Wrist (Multi-bone) Frontal
    - Rotation
      - Neck (Multi-bone) Axial
      - Shoulder (Ball Joint) Medial/Lateral
      - Wrist/Elbow (Multi Joint) Pronation
      - Hip (Ball) Lateral/Medial
      - Spine (Multi-bone) Axial
    - Circumduction
      - Neck (Multi-bone)
      - Shoulder (Ball Joint)
      - Hip (Ball Joint)
    - Special Motions
      - Elevation/ Depression
      - Protraction/ Retraction

- Plantar/ Dorsi Flexion
- Inversion/ Eversion Definition
- Joint, Motion, Muscle Charts

Author/s:

**Dr. Jack Wasserman**

Professor

Mechanical and Aerospace Engineering and Engineering Science

Dr. Wasserman has a Doctorate of Science in Biomedical and Mechanical Engineering, and is a retired professor of mechanical and aerospace engineering and engineering science. He has taught in the University setting for over 30 years developing course content for several biomechanical engineering courses as well as community and instructor fitness training courses. He was the coordinator for the Biomedical Engineering degree program at the University of Tennessee and has received numerous departmental, college and university teaching awards.

He has been involved in the fitness industry for over 20 years teaching land and water classes to a variety of participants and has presented several courses for fitness professionals in the conference and workshop settings. He is instrumental in developing the educational format for the courses produced by Fitness Learning Systems. He enjoys teaching aquatic fitness classes where he incorporates his engineering and medical concepts into class practice, providing superior training concepts for all ages, especially older adults.

**June Lindle MA,**

June M. Chewing, BS MA has been presenting educational health/ wellness lectures and fitness classes to corporations, the community, and fitness professionals since 1985 both in the U. S. and Internationally. June serves on the Aquatic Exercise Association Research Council, Certification Council, and is a recipient of the AEA 1995 Achievement Award, and 2001 Contribution to the Aquatic Fitness Industry Award. She serves as adjunct faculty for Cincinnati State College, developing and teaching several courses for the Health Fitness Technician degree program. She is President of Fitness Learning Systems, a CEC education company. She specializes in educational formatting and programming.

**Gary Moritz MS, CPT**

Gary has been working in the fitness/rehabilitation industry since 1988. He worked in corporate wellness with General Motors, GE and Ford Motor Company before serving as an exercise physiologist in physical therapy and cardiac rehab clinics. Gary currently works as the development manager for Fitness Learning Systems as well as adjunct faculty for Cincinnati State Technical and Community College.

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