

# Group Fitness Instructor Certification Exam Content Outline

The Examination Content Outline is essentially a blueprint for the exam. As you prepare for the exam, it is important to remember that all exam questions are based on this outline.

## Target Audience Statement

The certified Group Fitness Instructor is responsible for planning and leading group exercise sessions to enhance the general well-being (e.g., fitness, health) and exercise skills of participants. The certified Group Fitness Instructor is at least 18 years of age and possesses a valid certificate in cardiopulmonary resuscitation (CPR).

## Domains, Tasks, and Knowledge and Skill Statements

A Role Delineation Study completed for the Group Fitness Instructor certification first identified the major categories of responsibility for the professional. These categories are defined as “Domains” and it was determined that the profession could be divided into four Performance Domains, or major areas of responsibility. These Performance Domains are:

- Domain I: Exercise Programming and Class Design

- Domain II: Group Instructional Methods
- Domain III: Group Leadership Methods
- Domain IV: Professional Responsibilities

The Group Fitness Instructor draws upon knowledge from four foundational sciences, which are included within a Content Domain called Applied Exercise Science.

These sciences are:

- Kinesiology (anatomy, kinesiology, biomechanics)
- Physiology
- Nutrition and weight control
- Exercise psychology

This Content Domain includes all topics important to the competence of Group Fitness Instructors and applies primarily to the following Performance Domains: Exercise Programming and Class Design, Group Instructional Methods, and Group Leadership Methods.

Within each Performance Domain, there is additional Domain-specific information referring to tests, procedures, and techniques.

Each Domain is composed of Task Statements, which detail the job-related functions under each Domain. Each Task Statement is further divided into Knowledge and Skill Statements that detail the scope of information required and how that

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Table 1: Exam Content Outline: Group Fitness Instructor Certification

| Applied Exercise Science              |             |              |                  |                   |            |                            |                     |
|---------------------------------------|-------------|--------------|------------------|-------------------|------------|----------------------------|---------------------|
| Performance Domain                    | Total Items | KINESIOLOGY  |                  |                   |            |                            |                     |
|                                       |             | Anatomy (17) | Kinesiology (17) | Biomechanics (21) | Physiology | Nutrition & Weight Control | Exercise Psychology |
| Exercise Programming and Class Design | 61          | 9            | 9                | 11                | 19         | 5                          | 8                   |
| Group Instructional Methods           | 39          | 6            | 6                | 7                 | 12         | 3                          | 5                   |
| Group Leadership Methods              | 17          | 2            | 2                | 3                 | 6          | 2                          | 2                   |
| Professional Responsibilities         | 8           | 0            | 0                | 0                 | 0          | 0                          | 0                   |
| <b>Total:</b>                         | <b>125</b>  | <b>17</b>    | <b>17</b>        | <b>21</b>         | <b>37</b>  | <b>10</b>                  | <b>15</b>           |

information is applied in a practical setting.

The Domains are presented in Table 1 in two ways to demonstrate how the Content and Performance Domains are interconnected:

- Performance Domains are listed vertically:

Exercise Programming and Class Design, Group Instructional Methods, Group Leadership Methods, and Professional Responsibilities

- Content Domains are listed horizontally:

Kinesiology (Anatomy, Kinesiology, Biomechanics), Physiology, Nutrition and Weight Control, and Exercise Psychology

### DOMAIN I: EXERCISE PROGRAMMING AND CLASS DESIGN 49%

#### Task 1

**Construct a group fitness class of basic exercise components using appropriate movements, music, and/or equipment to promote the health and wellness of class participants.**

*Knowledge of:*

1. Basic components of a class (e.g., warm-up, conditioning, cool-down, flexibility)
2. Music styles and tempos appropriate for

each class format or class component

3. Use and application of various group fitness-related equipment (e.g., steps, indoor cycles, free weights, elastic resistance, medicine balls, stability balls, balance-related tools)
4. Varied class formats (e.g., traditional high-impact/low-impact, step, kickboxing, indoor cycling, aquatic exercise, interval, circuit, muscular conditioning, sports conditioning, flexibility, mind-body activities)
5. Functional-training principles to improve the quality of life

*Skill in:*

1. Lesson planning to determine the content and sequence of various types of general group exercise classes
2. Demonstrating proper use of group fitness-related equipment
3. Integrating functional-training principles into a group fitness class setting

#### Task 2

**Accommodate varied fitness levels of participants by applying general fitness principles (e.g., varying frequency, intensity, duration, mode, sets, reps) to provide safe and effective classes.**

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### *Knowledge of:*

1. Major health-related components of fitness including cardiovascular endurance, muscular strength, muscular endurance, flexibility, and body composition
2. The current and established guidelines for improving and maintaining cardiorespiratory endurance, muscular fitness, and flexibility with reference to mode of activity, intensity, duration, and frequency
3. Skill-related fitness components including balance, agility, speed, power, coordination, and reaction time

### *Skill in:*

1. Adapting the health-related fitness components to accommodate various fitness levels within the class
2. Incorporating the skill-related fitness components, where appropriate
3. Manipulating various exercises, equipment, music, and approaches within any class format

### Task 3

**Incorporate progression in class design consistent with established standards and guidelines with variation in exercise selection, equipment, music, and approach to achieve fitness goals, reduce potential injury and attrition, and alleviate boredom.**

### *Knowledge of:*

1. Methods to vary the exercises, equipment, music, and approach selected within a class format
2. The concepts of variety and progression as they relate to the prevention of injury and boredom

### *Skill in:*

1. Varying the class in accordance with fitness principles

2. Varying music, exercise selection, equipment, and approach
3. Recognizing the need for progression
4. Implementing appropriate progression rates

### Task 4

**Accommodate the needs of special populations by recognizing their limitations and making appropriate exercise adaptations to provide safe and effective classes.**

### *Knowledge of:*

#### *General*

1. General medical conditions such as diabetes, hypertension, heart disease, arthritis, osteoporosis, musculoskeletal disorders, respiratory disorders, obesity
2. How exercise impacts each of these medical conditions
3. Common physical disabilities

#### *Older Adults:*

1. Aging process and its impact on the cardiorespiratory, muscular, skeletal, metabolic, neurologic, thermoregulatory, and psychological systems
2. Health and medical concerns of mature adults and appropriate exercise selection and modifications for each
3. Appropriate music for older-adult classes

#### *Youth:*

1. Thermoregulation, anaerobic capacity, intensity monitoring, muscular conditioning, safety, and adult supervision
2. Importance of program design (e.g., programming, equipment, mechanics, adaptations, progression):
  - (a) Gradual increase in exercise intensity
  - (b) Improvement in adequate muscular strength and flexibility
  - (c) Improvement in adequate cardiorespiratory function

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- (d) Proper body mechanics
- (e) Appropriate equipment
- (f) Short-term intermittent activity

### *Pregnant and Postpartum Participants:*

1. American College of Obstetricians and Gynecologists (ACOG) recommendations for exercise during pregnancy and the postpartum period, as well as contraindications and warning signs requiring cessation of exercise
2. Risks associated with exercise during pregnancy that are related to musculoskeletal, cardiorespiratory, metabolic, and thermoregulatory processes
3. Appropriate method for monitoring intensity

### *Obesity:*

1. Medical and physical problems specific to obesity, including cardiorespiratory, musculoskeletal, and thermoregulatory problems
2. Appropriate class modifications for obesity-related problems, including cardiorespiratory, musculoskeletal, and thermoregulatory changes

### *Skill in:*

#### *General:*

1. Recognizing and understanding medical conditions that affect a participant's ability to exercise safely in class, such as diabetes, hypertension, heart disease, arthritis, osteoporosis, musculoskeletal disorders, asthma, chronic obstructive pulmonary disease, obesity
2. Integrating appropriate exercise for participants with medical conditions who have been cleared by a physician
3. Recognizing health problems that interfere with a participant's ability to exercise safely within a specific class format

### *Older Adults:*

1. Recognizing changes associated with the

aging process and the implications on exercise

2. Modifying class design based on American College of Sports Medicine (ACSM) guidelines (e.g., frequency, intensity, duration, mode, sets, reps)
3. Designing safe and effective classes that address the specific health and medical concerns of the older adult

### *Youth:*

1. Recognizing special concerns related to teaching youth
2. Modifying the class based on established guidelines (e.g., frequency, intensity, duration, mode, sets, reps)
3. Using appropriate body mechanics and equipment

### *Pregnant and Postpartum Participants:*

1. Modifying the class based on established ACOG guidelines (e.g., frequency, intensity, duration, mode, sets, reps).
2. Adapting class exercises and transitions to accommodate postural, weight, cardiorespiratory, and musculoskeletal changes

### *Obesity:*

1. Recognizing special concerns related to teaching obese or overweight participants
2. Modifying class design based on American College of Sports Medicine (ACSM) guidelines (e.g., frequency, intensity, duration, mode, sets, reps)
3. Designing safe and effective classes that address the specific health and medical concerns of the obese or overweight client

## **Task 5**

**Adjust class design for various environmental conditions (e.g., cold, heat, humidity, altitude, acoustics, pollution) to ensure a safe and comfortable exercise**

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### setting for all participants.

#### *Knowledge of:*

1. Specific environmental factors as they relate to the safety of the class participants (e.g., cold, heat, humidity, altitude, acoustics, exercise surface, exercise area)
2. Physiological responses and adaptations that result from variations in environmental conditions
3. Recommendations and precautions for exercising in heat, cold, humidity, altitude, and pollution

#### *Skill in:*

1. Adapting class content and/or programming based on specific environmental conditions to maximize participants' safety
2. Adapting class formats relative to environmental conditions

## DOMAIN II: GROUP INSTRUCTIONAL METHODS 31%

### Task 1

**Choose an appropriate and effective teaching method to accommodate various learning styles and cultural differences by analyzing the skills, interests, lifestyles, and preferences of the class participants.**

#### *Knowledge of:*

1. Teaching styles (e.g., command, practice, reciprocal, self-check, inclusion) appropriate for a group fitness class
2. Teaching strategies (e.g., slow-to-fast, repetition reduction, spatial, part-to-whole, simple-to-complex) used to facilitate participant learning

3. Choreographic methods (e.g., freestyle vs. structured)
4. Domains and stages of learning
5. Various learning styles (e.g., visual, auditory, kinesthetic)

#### *Skill in:*

1. Using teaching styles (e.g., command, practice, reciprocal, self-check, inclusion) appropriate for a group fitness class
2. Selecting appropriate teaching strategies (e.g., slow-to-fast, repetition reduction, spatial, part-to-whole, simple-to-complex) to accommodate participant fitness and skill levels and class modality
3. Accommodating participants in the various stages of learning

### Task 2

**Monitor intensity using a variety of methods so that participants can exercise at the most appropriate levels for improving health and fitness.**

#### *Knowledge of:*

1. Reasons for monitoring exercise intensity
2. Significance of resting, exercise, and recovery heart rates
3. Methods for monitoring exercise intensity: heart rate, talk test, Borg's rating of perceived exertion (RPE), dyspnea scale, and metabolic equivalents (METs)
4. Heart-rate response to various class components (warm-up, cardiovascular phase, muscular conditioning, and cool-down)
5. Applications and limitations in the calculations of target heart rate: percent of heart-rate reserve, age-predicted maximum heart rate, and measured maximum heart rate
6. Techniques, precautions, and limitations for monitoring heart rate
7. Precautions and limitations to monitoring heart-rate intensity (abnormal heart-rate

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responses, effects of medications, pregnancy and other special populations)

### *Skill in:*

1. Implementing and explaining the procedures for monitoring heart-rate intensity (e.g., carotid and radial sites)
2. Using and explaining the talk test, RPE, and dyspnea scales as methods for monitoring exercise intensity
3. Modifying exercise intensity
4. Identifying signs and symptoms of over-exercising and making appropriate modifications
5. Selecting an appropriate intensity-monitoring method to accommodate special populations (e.g., pregnancy) and/or the effects of medications on heart-rate response

### Task 3

**Instruct participants using succinct and timely cues to prepare participants for the next movement and facilitate safe and effective exercise performance.**

### *Knowledge of:*

1. Various types of verbal, visual, and kinesthetic cueing methods
2. When to cue an exercise
3. Appropriate use of music
4. Voice projection, vocal control, and how to avoid vocal stress
5. Appropriate volume levels needed for effective cueing and prevention of vocal stress

### *Skill in:*

1. Using the various types of verbal and visual cueing methods effectively
2. Cueing exercises at the appropriate time
3. Stating cues in as few words as possible
4. Projecting the voice effectively
5. Using visual cues to accommodate special needs (language barriers, hearing impaired)

6. Cueing and teaching movement of exercise (e.g., 32-count phrase when applicable)

### Task 4

**Correct improper technique using appropriate strategies to prevent injury and/or improve performance of participants.**

### *Knowledge of:*

1. Appropriate body alignment and posture for various exercises
2. How to apply effective instructional techniques for correcting technique and movements
3. Precautions when using touch to correct improper form

### *Skill in:*

1. Executing exercises with proper form and technique
2. Identifying improper exercise form and technique
3. Providing cues to encourage participants to correct their form and exercise execution
4. Applying effective instructional techniques for error correction
5. Correcting improper exercise form and technique in a friendly manner
6. Reminding participants to use proper form and technique
7. Walking around the room to make appropriate corrections while maintaining class control

### Task 5

**Provide educational and motivational feedback using specific statements and demonstrations to maintain and improve exercise performance.**

### *Knowledge of:*

1. The types of feedback (e.g., corrective, value, and neutral statements)

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2. Appropriate use of feedback (e.g., corrective, value, and neutral statements)
3. Components of effective feedback (e.g., informational rather than controlling, based on performance standards, specific and immediate)
4. Benefits of various exercises and how they improve the health- and skill-related components of fitness
5. Factors that affect participants' self-esteem and body image

### *Skill in:*

1. Applying appropriate feedback based on participant skill, fitness level, and/or cultural background
2. Providing information regarding the benefits of various exercises and how they improve the health- and skill-related components of fitness
3. Using feedback to motivate participants and encourage adherence
4. Maintaining class control while providing individualized feedback
5. Using positive reinforcement to enhance participants' self-esteem and body image

### Task 6

**Provide exercise modifications to accommodate multiple fitness levels and special populations by demonstrating variations and options.**

### *Knowledge of:*

1. The contraindications and musculoskeletal, cardiorespiratory, and metabolic adaptations to exercise affecting participants who have been cleared by a physician or appropriate medical professional
2. Methods used to accommodate various fitness levels and populations within a class

### *Skill in:*

1. Teaching multiple options for most exercises to accommodate various fitness levels and populations in the same class
2. Incorporating adaptations for various special populations (e.g., musculoskeletal, cardiovascular, respiratory, and metabolic conditions)
3. Modifying exercises for older adults, youth, pregnant and postpartum women, and obese participants

## DOMAIN III: GROUP LEADERSHIP METHODS 14%

### Task 1

**Apply interpersonal skills by interacting with participants to build individual rapport, relationships, and adherence.**

### *Knowledge of:*

1. Communication techniques that enhance participant/instructor relationships (e.g., active listening, open-ended questioning, acknowledgement)
2. Participant-centered teaching approaches
3. Strategies to facilitate conflict resolution

### *Skill in:*

1. Mirroring and matching
2. Establishing an atmosphere of trust
3. Establishing rapport (e.g., learning participant names, being accessible and approachable)
4. Identifying individual and group needs
5. Building group camaraderie
6. Recognizing and interpreting nonverbal communication
7. Addressing and alleviating class conflicts

### Task 2

**Facilitate a sense of belonging by building a comfortable exercise environment for**

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### class participants to encourage success.

#### *Knowledge of:*

1. Effective verbal and nonverbal communication methods
2. Verbal articulation and inflection to enhance the quality of the message (e.g., word emphasis, volume, speed of delivery)
3. Empathy and compassion
4. Various personality types
5. Various communication and learning styles

#### *Skill in:*

1. Observing and interpreting nonverbal communication
2. Listening effectively (e.g., use of minimal encouragement, reflecting, summarizing)
3. Using and maintaining eye contact to build relationships
4. Recognizing the special needs of participants

### Task 3

**Motivate participants to set realistic exercise goals and take ownership of their exercise experience to achieve optimal results and develop a lifelong exercise habit.**

#### *Knowledge of:*

1. Effective goal-setting techniques
2. Motivational strategies that engage participants with various skills, limitations, preferences, and expectations
3. Techniques to develop self-confidence and self-efficacy
4. Support systems to foster accountability and improve adherence
5. Potential barriers to exercise adherence

#### *Skill in:*

1. Selecting appropriate motivational tech-

niques for desired outcomes

2. Selecting appropriate communication styles
3. Recognizing opportunities to create support systems within the class setting
4. Recognizing the special needs of participants
5. Providing tools to establish support systems outside of the class setting

### Task 4

**Educate participants about lifestyle, fitness, and health using credible resources for participants to achieve optimal results.**

#### *Knowledge of:*

1. Current and relevant research material and information
2. Effective delivery systems for communicating
3. Basic behavior theory (e.g., health-belief model, stages of change)
4. Strategies for behavior modification

#### *Skill in:*

1. Recognizing appropriateness and timeliness of delivering educational material
2. Obtaining credible material and information for class participants
3. Identifying stages of learning (e.g., cognitive, associative, autonomous)

## DOMAIN IV: PROFESSIONAL RESPONSIBILITIES 6%

### Task 1

**Adhere to applicable law and industry guidelines by maintaining a working knowledge of current principles and accepted professional practices to protect the interests of participants and minimize the risk of litigation.**

#### *Knowledge of:*

1. Assumption of risk, including risk assess-

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- ment, waiver, and informed consent
- 2. Liability, including health screening, exercise recommendations, supervision, instruction, facilities, and equipment
- 3. Negligence, both contributory and comparative
- 4. Copyright law as it applies to music, print media, and film
- 5. Scope of practice
- 6. Standard of care
- 7. Employment status (e.g., independent contractor, employee)
- 8. Americans with Disabilities Act
- 9. Standards governing confidentiality
- 10. Important practices and behaviors when seeking employment (e.g., attire, audition procedures), subbing, and interacting with peers and participants

### *Skill in:*

- 1. Completing an accident/injury report
- 2. Safeguarding confidential information
- 3. Following industry guidelines to minimize risk of injury and litigation (e.g., adequate warm-up and cool-down, recognizing potential hazards, providing proper instruction)
- 4. Behaving in a professional manner when auditioning, subbing, and interacting with peers and participants

### Task 2

**Adhere to the ACE Code of Ethics by upholding its principles consistently to protect the interests of participants, enhance consumer confidence in the industry, and maintain professional responsibilities.**

### *Knowledge of:*

- 1. American Council on Exercise Code of Ethics
- 2. Standards governing confidentiality
- 3. Establishing and maintaining clear profes-

- sional boundaries
- 4. Upholding and enhancing public appreciation and trust for the health and fitness industry
- 5. Scope of practice
- 6. Current CPR, AED, and first-aid services
- 7. Fair and equal treatment for all clients
- 8. American Council on Exercise Professional Practices and Disciplinary Procedure

### *Skill in:*

- 1. Providing safe and effective exercise instruction
- 2. Safeguarding confidential information
- 3. Mentoring and dispensing knowledge and training
- 4. Referring clients to more qualified fitness, medical, or health professionals when appropriate
- 5. Administering CPR and AED if accessible
- 6. Administering basic injury-management procedures

### Task 3

**Respond to acute medical conditions and injuries as they arise by implementing CPR, AED, and first aid, obtaining necessary assistance, and following documentation procedures to provide appropriate care and risk-management.**

### *Knowledge of:*

- 1. CPR, AED, and basic first-aid procedures
- 2. Symptoms and types of musculoskeletal injuries
- 3. Factors associated with injury
- 4. Contraindications to exercise
- 5. Basic injury-management procedures (e.g., RICE: rest, ice, compression, elevation)
- 6. Facility risk-management and emergency protocols

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### *Skill in:*

1. Administering CPR and AED if accessible
2. Administering basic injury-management procedures

### Task 4

**Respond to emergencies as they arise by following established procedures and incident-reporting requirements to maximize participants' safety and manage risk.**

### *Knowledge of:*

1. EMS activation
2. Risk-management implementation protocols
3. Facility-evacuation procedures

### *Skill in:*

1. Completing an incident report
2. Leading the evacuation process of class participants in accordance with facility-evacuation procedures

### Task 5

**Protect clients and other interested parties by assessing insurance needs as they relate to group exercise instruction to minimize financial risk.**

### *Knowledge of:*

1. Professional liability insurance
2. General liability insurance
3. Worker's compensation insurance
4. Health and disability insurance
5. Property insurance
6. Business interruption insurance

### Task 6

**Enhance professional competence through ongoing education in current research and exercise modalities to optimize group fitness instruction.**

### *Knowledge of:*

1. Appropriate sources for acquiring continuing

education offered by individuals, conferences, colleges, universities, seminars, workshops, etc.

2. Credible and current health and physical-activity information and research

### *Skill in:*

1. Staying current with updated information and recommendations and applying them to teaching a class

## CONTENT DOMAIN: APPLIED EXERCISE SCIENCE

The Group Fitness Instructor draws upon knowledge from four foundational sciences, which are included within a Content Domain called Applied Exercise Science.

These sciences are:

- Kinesiology (anatomy, kinesiology, biomechanics)
- Physiology
- Nutrition and weight control
- Exercise psychology

This Content Domain includes all topics important to the competence of Group Fitness Instructors and applies primarily to the following Performance Domains: Exercise Programming and Class Design, Group Instructional Methods, and Group Leadership Methods.

### **Kinesiology (Anatomy, Kinesiology, Biomechanics)**

### *Knowledge of:*

#### *Anatomy*

1. General anatomy and function of the following systems: cardiovascular, musculoskeletal, cardiorespiratory, and neuromuscular
2. Function of the different types of joints of the body

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3. Anatomical terminology (e.g., landmarks, directional, planes of movement, position, muscle roles)
4. Major functions of the muscles (e.g., agonist, antagonist, stabilizer, assister)
5. Flow of blood through the heart

### *Knowledge of:*

#### *Kinesiology*

1. Human movement as it relates to making decisions concerning the safety of participants
2. Strategies for identifying areas of weakness and designing exercise and providing feedback to encourage improvement
3. Range of motion of the hip, knee, and ankle; hip flexion; hip extension; and hyperextension for improved strength and flexibility
4. Proper postural alignment, including lordosis, kyphosis, scoliosis, and hyperextension of the spine
5. Strategies for identifying abnormalities and neutral spine position
6. Prime movers in any given movement
7. Types of muscle contractions: isokinetic, isometric, isotonic (eccentric and concentric)
8. Principles of balance
9. Actions and application of major muscle groups of the upper extremity, lower extremity, and trunk
10. Factors affecting movement: neurological, proprioceptive, biomechanical, kinesthetic awareness
11. Difference between dorsiflexion and plantarflexion
12. Shoulder joint complex: scapulothoracic articulation, scapulohumeral rhythm
13. Concentric and eccentric movement
14. The term “winging” as it applies to the scapula
15. Scapular movements: elevation, depres-

sion, adduction, abduction, upward rotation, downward rotation

16. Relationship between joint mobility and muscular flexibility
17. Strategies for identifying participants with kinesthetic-awareness dysfunction

### *Knowledge of:*

#### *Biomechanics*

1. Joint mobility (e.g., torque, force)
2. Appropriate exercises based on biomechanics
3. Risks associated with muscular-strength training, improper body mechanics, and lifting techniques that may result in acute and chronic overuse
4. Newton’s Law as it relates to the analysis of human movement
5. Use of the laws of inertia, acceleration, and reaction as they apply to exercise

#### **Physiology**

### *Knowledge of:*

#### *Basic and Applied Exercise Physiology*

1. Components of physical fitness (e.g., muscular strength, muscular endurance, cardiorespiratory endurance, flexibility, body composition)
2. Cardiorespiratory terms as they apply to endurance training (e.g., cardiac output, stroke volume, heart rate, oxygen consumption, ventilation, respiration, aerobic capacity)
3. Principles of training as they apply to cardiorespiratory endurance (e.g., overload, specificity, reversibility, progression, training effect, adaptation)
4. Metabolic physiology, including anaerobic metabolism (e.g., phosphagen system, anaerobic glycolysis) and aerobic metabolism (e.g., aerobic glycolysis, fatty-acid oxidation)

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5. Anaerobic and aerobic energy systems in terms of rate and amount of ATP produced, limitations, and major use during physical activity
6. Roles of carbohydrates, fats, and proteins used as fuel for energy production
7. Acute responses to aerobic exercise
8. Cardiovascular and cardiorespiratory systems with respect to oxygen-carrying capacity, delivery, and extraction
9. Benefits of aerobic exercise for healthy participants and those with chronic disease (e.g., type 2 diabetes, arthritis, pulmonary disease, coronary heart disease)
10. Terminology as it applies to muscular fitness: training effect, resistance, overload, specificity, repetitions, sets, frequency, rest periods, progression, muscular atrophy, and hypertrophy
11. Benefits of muscular strength and endurance
12. Training principles to improve muscular strength and endurance training
13. Definition of, and risks associated with, performing the Valsalva maneuver during resistance training
14. Characteristics of fast- and slow-twitch muscle fibers (e.g., ability to use anaerobic and aerobic pathways)
15. Neuromuscular system, including the basic organization of the nervous and muscular systems
16. Sliding filament theory of muscle contraction
17. Types of muscle contractions (e.g., isotonic, isometric, isokinetic)
18. Roles of the Golgi tendon organ and muscle spindle in the regulation of muscle contraction
19. Static, dynamic, ballistic, and proprioceptive neuromuscular facilitation (PNF) stretches and the risks and benefits associated with each

### Nutrition and Weight Control

*Knowledge of:*

#### *Nutrition*

1. Function and types of carbohydrate, protein, and fat
2. Recommended percentage of calories from carbohydrate, protein, and fat in a balanced diet
3. Number of calories per gram in carbohydrate, protein, and fat
4. Current recommendations contained in the MyPyramid Food Guidance System
5. Current recommendations contained in the USDA's Dietary Guidelines for Americans
6. Dietary concerns for vegetarians
7. Specific functions and food sources of major vitamins and minerals
8. Function and food sources of antioxidants and phytochemicals
9. Function and food sources of fiber
10. Role of nutrition in various diseases (e.g., cardiovascular disease, hypertension, diabetes, cancer, osteoporosis, anemia)
11. Signs and symptoms of eating disorders (e.g., anorexia, bulimia, compulsive overeating)
12. Uses and potential hazards of supplements and ergogenic aids
13. Fitness instructor's scope of practice when discussing nutrition information and when to refer to a dietitian or other qualified healthcare professional
14. Recommended hydration guidelines
15. How to read a nutrition label

*Knowledge of:*

#### *Weight Control*

1. Energy balance and how to modify diet and exercise to affect weight
2. Number of calories in a pound of fat

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3. How to calculate desired body weight based on current weight and lean-body-mass percentage
4. Safe and effective weight-loss methods
5. Recommended amount of weight loss per week for unsupervised, safe, and effective weight loss (lean-muscle gain per month and body-fat loss per month)
6. Metabolic terminology (e.g., kilocalories, caloric expenditure, caloric deficit, caloric intake, energy balance)
7. Definition of body mass index, its limitations, and how it is used to classify weight status
8. Extreme approaches to weight loss

### Exercise Psychology

#### *Knowledge of:*

1. Attributes of an ideal fitness instructor
2. Motivational techniques used to optimize exercise adherence and other healthy lifestyle behaviors
3. Factors that influence adherence (e.g., social factors, personal factors, program factors, environmental factors)
4. Principles of learning theory with respect to effective teaching in a group exercise setting
5. Theories of behavioral change (e.g., health belief model, stages of change)
6. Issues related to body image
7. Use of relaxation/visualization to enhance the exercise experience
8. Importance of delivery in communicating feedback to a participant