Personal Trainer Knowledge, Skills, and Abilities (1/01/12)

1. Core Knowledge
   A. Kinesiology: Anatomy and Biomechanics
   B. Exercise Physiology
   C. Basic Nutrition and Weight Management
   D. Human Behavior

2. Health and Medical Review; and Fitness Assessment
   A. Health History Review
   A. C. Current Health Conditions Review
   B. Health-Related Fitness Appraisal

3. Fitness Training: Design, Implementation, and Evaluation
   A. Fitness Goal Setting
   B. Safe and Efficient Exercise
   C. Program Design: Cardiorespiratory, Strength, and Flexibility
   D. Program Evaluation

4. Professional Responsibilities
   A. Standards of Practice
   B. Leadership Techniques
   C. Basic Business Principles

1. Core Knowledge

A. Kinesiology: Anatomy & Biomechanics
   1.A.1 Knowledge of basic anatomy of the cardiovascular and respiratory systems and the interactions that form the cardiorespiratory system
   1.A.2 Knowledge of structural components of the musculoskeletal system (bone, skeletal muscle, and connective tissues) and muscles that comprise major muscle groups
   1.A.3 Knowledge of terms related to anatomical positions and movement: superior, inferior, proximal, distal, medial, lateral, anterior, and posterior
   1.A.4 Knowledge of three planes of movement (sagittal, transverse, frontal)
   1.A.5 Knowledge of terminology related to joint movement: flexion, extension, hyperextension, adduction, abduction, rotation, circumduction, supination, pronation, inversion, eversion, elevation, depression, dorsi flexion, and plantar flexion
   1.A.6 Knowledge of and ability to classify three types (skeletal, smooth, cardiac) of muscle tissue in the body
   1.A.7 Knowledge of roles muscles can assume (agonist, antagonist, stabilizer, and neutralizer)
   1.A.8 Knowledge of four unique properties of muscle tissue: excitability, contractibility, extensibility, and elasticity
   1.A.9 Knowledge of three major types of muscular contractions (isometric, isotonic, and isokinetic) and the two types of isotonic contractions (concentric and eccentric) and their use in training
   1.A.10 Knowledge of biomechanical movement patterns associated with common activity modes (i.e., walking, jogging, swimming, cycling, resistance training, etc.)
   1.A.11 Knowledge of biomechanical guidelines for resistance training for maintaining strength and good posture
   1.A.12 Ability to identify and locate joint actions produced by major muscles and muscle groups responsible for gross motor movement
   1.A.13 Ability to identify opposing muscle groups
   1.A.14 Ability to identify two-joint muscles
   1.A.15 Ability to identify joint actions occurring in each plane of movement
   1.A.16 Ability to identify muscles and joint actions involved in specific exercises
B. Exercise Physiology

1.B.1 Knowledge of the health-related components of fitness
1.B.2 Knowledge of health benefits achievable through all types of physical activity
1.B.3 Knowledge of the acute response of the cardiovascular system (heart rate, stroke volume, cardiac output, a-v \( \text{O}_2 \) difference, blood pressure, \( \text{VO}_2 \)) to exercise
1.B.4 Knowledge of typical resting vs. exercise values for factors involved in \( \text{VO}_2 \)
1.B.5 Knowledge of characteristics of cardiorespiratory training (aerobic and anaerobic) and related physiological adaptations at rest and during submaximal and maximal exercise
1.B.6 Knowledge of the physiologic process for muscular strength gains and the adaptations that occur as a result of resistance training
1.B.7 Knowledge of the mechanisms of flexibility training (muscle spindles, Golgi tendon organ, stretch reflex)
1.B.8 Knowledge of Sliding Filament Theory of muscle contraction
1.B.9 Knowledge of 3 energy systems: Phosphocreatine, Anaerobic Glycolysis, and Aerobic
1.B.10 Knowledge of cause of delayed onset muscle soreness
1.B.11 Knowledge of various fuel sources within the body and how they are mobilized during physical activity
1.B.12 Knowledge of factors that can be assessed through metabolic exercise testing
1.B.13 Knowledge of various clinical and field methods for assessing or estimating \( \text{VO}_2 \max \)
1.B.14 Knowledge of three types of skeletal muscle
1.B.15 Knowledge of the adaptations to cardiorespiratory, resistance, and flexibility training across populations
1.B.16 Knowledge of adaptations to exercise environment (heat, cold, altitude, etc.) by the body during exercise training
1.B.17 Ability to identify causes of and apply strategies for delaying fatigue during aerobic and anaerobic exercise
1.B.18 Ability to identify the energy system that predominates for different types of physical activity tasks
1.B.19 Ability to identify skeletal muscle fiber type characteristics, measurement of muscle fiber type, and influence of fiber type on exercise performance potential
1.B.20 Ability to perform calculations related to assessing or estimating \( \text{VO}_2 \)

C. Basic Nutrition and Weight Management

1.C.1 Knowledge of essential nutrients; and ability to list caloric value, function, major food sources, and RDA
1.C.2 Knowledge of roles and mechanisms of carbohydrate, fat, and protein with regard to aerobic and anaerobic metabolism
1.C.3 Knowledge of nutrition/disease link across various medical conditions (osteoporosis, coronary artery disease, certain cancers, metabolic conditions) and nutrients to increase/decrease to reduce disease risk
1.C.4 Knowledge of resting metabolic rate and basal metabolic rate and its relevance to weight management
1.C.5 Knowledge of antioxidants and their possible role in disease prevention
1.C.6 Knowledge of public healthy eating tools such as current US Dietary Guidelines for Americans and MyPlate
1.C.7 Knowledge of how to use MyPlate to estimate current caloric intake, target caloric intake, and requirements from the different food groups
1.C.8 Knowledge of what constitutes a ‘serving’ of grains, fruit, vegetables, dairy, healthy oils, and meat/beans
1.C.9 Knowledge of common eating disorders and factors related to the female athlete triad
1.C.10 Knowledge of effects of megadosing with certain vitamins and minerals
1.C.11 Knowledge of ergogenic aids’ effects on physical performance and their potential risks
1.C.12 Knowledge of reliable sources of nutrition and weight management information
1.C.13 Knowledge of exercise program guidelines for weight control/management
1.C.14 Knowledge of inappropriate weight loss methods
1.C.15 Skill in recommending general nutritional guidelines for healthy adults to gain general health benefits according to US Dietary Guidelines within scope of practice
1.C.16 Skill in recommending general nutritional guidelines for healthy adults to achieve favorable body composition results within scope of practice
1.C.17 Skill in recommending general nutritional guidelines for healthy adults to enhance sports performance within scope of practice
1.C.18 Ability to use methods of estimating an individual's resting metabolic rate (RMR) and basal metabolic rate (BMR) and apply results in program design for weight management
1.C.19 Ability to use the energy balance equation to achieve goals (weight loss, weight management, weight gain) within an appropriately defined amount of time
1.C.20 Ability to perform basic calculations related to nutrient intake and caloric expenditure

D. Human Behavior
1.D.1 Knowledge of behavior change process and its importance in exercise adherence
1.D.2 Knowledge of adult learning styles and their impact on the adoption of new behaviors
1.D.3 Knowledge of research-based methods and techniques of motivating human behavior and performance
1.D.4 Knowledge of effective goal setting and behavior reinforcement techniques
1.D.5 Knowledge of methods/products available in the industry to increase adoption of physical activity
1.D.6 Skill in using communication techniques (active listening, empathy, open-ended questions, feedback) to build effective change relationships
1.D.7 Skill in understanding and leveraging an individual's actions/reactions to bring about positive behavior change
1.D.8 Skill in planning and designing programs to promote the development of exercise confidence
1.D.9 Skill in identifying individual motivation cues to maximize motivational techniques
1.D.10 Skill in identifying individual learning styles and adapting strategies to meet learning needs
1.D.11 Ability to classify and respond to individuals by stage of behavior change using the Transtheoretical Model of Behavior Change and apply stage-appropriate strategies
1.D.12 Ability to help an individual identify their barrier(s) to making positive behavior changes; and skill in assisting them to address/remove barrier(s)
1.D.13 Ability to identify and use adherence strategies for long-term maintenance of healthy behaviors
Personal Trainer Knowledge, Skills, and Abilities (1/01/12)

2. Health and Medical Review, and Fitness Assessment

A. Previous and Current Health Conditions Review

2.A.1 Knowledge of purpose and goals of reviewing an individual's previous and current health conditions
2.A.2 Knowledge of sophisticated vs. practical screening techniques; ability to discern in which setting they are most appropriate
2.A.3 Knowledge of the causes and effects of common respiratory, cardiovascular, metabolic, and skeletal/muscular conditions that warrant further evaluation by a medical professional prior to exercise participation
2.A.4 Knowledge of major and contributing coronary risk factors and cut points indicative of risk (example: ATP-III Guidelines for blood cholesterol levels, JNC-7 Guidelines for resting blood pressure) and methods of reducing risk factors
2.A.5 Knowledge of American College of Sports Medicine's absolute and relative contraindications to exercise testing
2.A.6 Knowledge of common medications used to reduce coronary risk factors and the medication's effect on heart rate at rest and during submaximal and maximal exercise
2.A.7 Knowledge of effects of common pharmacological agents (example: antianxiety/depression medications, antihistamines, bronchodilators, weight loss medications) on physical activity
2.A.8 Knowledge of various body fat measurement methods and the relative advantages/disadvantages of each method
2.A.9 Knowledge of common postural deviations and associated bone/skeletal muscle involvements
2.A.10 Knowledge of common assessments used to measure range of motion and to identify postural abnormalities
2.A.11 Knowledge of impact of acute or chronic skeletal and muscular conditions on exercise testing and design
2.A.12 Skill in soliciting and recording information used to assess and evaluate health and fitness status
2.A.13 Skill in measurement of resting blood pressure and heart rate
2.A.14 Skill in methods of measuring body composition (skinfold calipers and waist circumference measurement)
2.A.15 Skill in use of measurement devices to obtain and record various body measurements
2.A.16 Ability to apply current national Physical Activity Guidelines to determine if an individual currently meets physical activity recommendations
2.A.17 Ability to determine appropriate screenings for individuals based upon previous and current conditions
2.A.18 Ability to calculate and classify Body Mass Index results for men and women
2.A.19 Ability to compare individual and total risk factors to evaluate relative risk in individuals and populations
2.A.20 Ability to categorize an individual's risk level based upon the ACSM Risk Stratification System
2.A.21 Ability to administer the Physical Activity Readiness Questionnaire
2.A.22 Ability to explain and administer an Informed Consent
2.A.23 Ability to recognize common postural deviations
2.A.24 Ability to identify skeletal and muscular factors or conditions that may require input from a qualified healthcare provider prior to exercise testing and design
2.A.25 Ability to recognize acute conditions that require referral to a healthcare provider

B. Health-Related Fitness Assessment

2.B.1 Knowledge of the terminology, purpose, and procedures for current methods of assessing cardiorespiratory, strength, and flexibility fitness levels
2.B.2 Knowledge of criteria for terminating a fitness assessment test
2.B.3 Skill in administering fitness assessment tests
2.B.4 Skill in instructing individuals in the performance of fitness assessment tests
2.B.5 Ability to perform basic mathematical calculations to solve basic cardiorespiratory and fitness formulas required during the assessment of fitness status
2.B.6 Ability to apply and interpret statistical norms to determine cardiorespiratory, strength, and flexibility fitness levels
2.B.7 Ability to identify and implement appropriate modifications for fitness testing based on known characteristics (obesity, balance problems, age, etc.)
Personal Trainer Knowledge, Skills, and Abilities (1/01/12)

3. Fitness Training: Design, Implementation, and Evaluation

A. Fitness Goal Setting

3.A.1 Knowledge of the purpose of and appropriate criteria for goal setting
3.A.2 Knowledge of change over time guidelines for setting cardiorespiratory fitness, absolute and dynamic strength, flexibility, and body composition goals
3.A.3 Ability to apply principles of Goal Setting Theory to creation of goals
3.A.4 Ability to create goals based on normative data
3.A.5 Ability to create goals based on percent change data
3.A.6 Ability to recognize and translate desired outcomes into challenging, realistic, and measurable (SMART) goals
3.A.7 Ability to work collaboratively with individuals to set goals based upon fitness assessment outcomes and individual desires
3.A.8 Ability to calculate percent change between assessment periods and assess goal attainment

B. Safe and Efficient Exercise

3.B.1 Knowledge of purpose and mechanisms of proper warm up and cool down techniques
3.B.2 Knowledge of proper breathing techniques while performing cardiovascular, strength, and flexibility exercises
3.B.3 Knowledge of safety rules and procedures for cardiorespiratory, strength, and flexibility activities to prevent injury and/or overtraining
3.B.4 Knowledge of safety rules and procedures for using exercise equipment
3.B.5 Knowledge of importance and benefits of planning the exercise session and recording session outcomes
3.B.6 Knowledge of signs and symptoms of a heart attack, stroke, and other acute health related issues
3.B.7 Knowledge of types of exercise-related injuries such as strains, sprains, bursitis, shin splints, their signs/symptoms, and impact on exercise session
3.B.8 Knowledge of contraindicated or “risky” exercises and safer alternatives
3.B.9 Knowledge of modified, amplified, or alternative exercises to accommodate different levels of fitness, abilities, and/or to prevent exacerbation of chronic/acute conditions
3.B.10 Knowledge of various environmental effects on exercise risk and appropriate safety guidelines
3.B.11 Skill in instructing individuals in how to perform activities
3.B.12 Skill in determining the kind of tools and equipment needed to effect desired results
3.B.13 Skill in recognizing pertinent abilities or physical limitations, and selecting and using appropriate training methods, equipment, and procedures
3.B.14 Skill in monitoring and recognizing signs of discomfort/distress during physical activity and responding appropriately
3.B.15 Ability to teach and demonstrate use of cardiorespiratory equipment such as treadmills, stationary cycles, elliptical machines
3.B.16 Ability to inspect and maintain fitness equipment and physical activity surroundings to ensure safety
3.B.17 Ability to monitor and recognize proper and improper exercise technique and apply biomechanical principles to provide corrective measures necessary for proper exercise execution
3.B.18 Ability to explain the Rating of Perceived Exertion Scale (Borg Scale) and use to evaluate exercise intensity
3.B.19 Ability to monitor exertion levels; and adjust training as necessary in response to underexertion or overexertion to maximize physical activity benefits
3.B.20 Ability to teach and demonstrate use of resistance training equipment (weight machines, free weights, small apparatuses, resistance tubing, others) using proper exercise form and technique
3.B.21 Ability to teach and demonstrate flexibility exercises
3.B.22 Ability to develop and follow established injury and/or emergency procedures including CPR, complete injury report form(s), and refer injured persons to an appropriate healthcare professional
3.B.23 Ability to identify and recommend appropriate hydration methods dependent on type and length of physical activity
3.B.24 Ability to recognize dehydration symptoms and provide appropriate response(s)
3.B.25 Ability to recommend appropriate clothing, shoes, and accessories for physical activity
Personal Trainer Knowledge, Skills, and Abilities (1/01/12)

C. Program Design: Cardiorespiratory, Strength, Flexibility

3.C.1 Knowledge of necessary criteria for an exercise to be considered aerobic
3.C.2 Knowledge of exercise principles of overload, specificity, and progression
3.C.3 Knowledge of methods to determine target heart rate (heart rate reserve, maximal heart rate, and others)
3.C.4 Knowledge of primary, secondary, and non-aerobic activities
3.C.5 Knowledge of components of a cardiorespiratory exercise program (mode, frequency, intensity, and duration)
3.C.6 Knowledge of definitions of strength, absolute strength, dynamic strength, and power
3.C.7 Knowledge of motor-related fitness components and basic techniques to train these components
3.C.8 Knowledge of concepts of hypertrophy, motor unit recruitment, and hyperplasia
3.C.9 Knowledge of estimating the 1 Repetition Maximum (1RM)
3.C.10 Knowledge of and associated interactions between frequency, intensity, repetitions, sets, total volume, range of motion, and tempo
3.C.11 Knowledge of resistance training principles and resistance training systems (Super Set, Pyramid Training, etc)
3.C.12 Knowledge of core stabilization and appropriate training methods to increase core strength and core endurance
3.C.13 Knowledge of periodization of training programs
3.C.14 Knowledge of methods of and exercise program guidelines for flexibility training
3.C.15 Skill in selection, proper application, and modification/amplification of cardiorespiratory training exercises within abilities and goals
3.C.16 Skill in selection, proper application, and modification/amplification of resistance training exercises within abilities and goals
3.C.17 Skill in selection, proper application, and modification/amplification of flexibility training exercises within abilities and goals for maintaining or improving range of motion/extensibility
3.C.18 Ability to apply current national physical activity Guidelines for achieving health benefits to cardiorespiratory and strength training program design
3.C.19 Ability to use an individual's current level of cardiorespiratory fitness to appropriately determine mode, intensity, and/or duration of cardiorespiratory training
3.C.20 Ability to determine an individual's target heart rate, including appropriate modifications when required
3.C.21 Ability to apply aerobic and anaerobic metabolism principles and enlist specific training methods to improve performance and bring about desired adaptations
3.C.22 Ability to incorporate an interval training program, if desired and appropriate, that is based on an individual's current fitness level and ability
3.C.23 Ability to provide appropriate cardiorespiratory training program progression
3.C.24 Ability to use an individual's current level of strength to appropriately determine mode, frequency, intensity, and progression of resistance training
3.C.25 Ability to train to specific goals based on muscle fiber type properties
3.C.26 Ability to apply health and fitness status data related to acute and chronic physical and health conditions and appropriately modify mode, frequency, intensity, and/or duration to develop suitable individualized cardiorespiratory and strength training programs to meet goals and/or special requirements
3.C.27 Ability to apply appropriate flexibility techniques and methods for desired results

D. Program Evaluation

3.D.1 Skill in adjusting program design in response to client actions or new information
3.D.2 Skill in gauging exercise intensity and making appropriate program design adjustments
3.D.3 Ability to monitor progress toward goals and adapt/adjust program(s) as needed
3.D.4 Ability to measure training effects over time
4. Professional Responsibilities

A. Standards of Practice

4.A.1 Knowledge of boundaries that determine scope of practice for personal trainers
4.A.2 Knowledge of liability types and issues related to health history review, fitness assessment, and program design/implementation and methods of minimizing liability/risk
4.A.3 Knowledge of confidentiality practices
4.A.4 Knowledge of current research in physical activity and exercise and their effects on various health conditions/outcomes
4.A.5 Knowledge of appropriate referral resources and professionals
4.A.6 Ability to discuss the importance of the health-related components of fitness
4.A.7 Ability to identify and communicate specific lifestyle changes (i.e., non-pharmacological) that are associated with improvements in various health conditions
4.A.8 Ability to provide relevant and reputable information and resources regarding nutrition, weight control, and lifestyle issues
4.A.9 Ability to complete requirements to maintain certification (continuing education, CPR, etc.)

B. Leadership Techniques

4.B.1 Knowledge of ethics and professional practices
4.B.2 Knowledge and use of appropriate clothing, shoes, and accessories for the fitness professional
4.B.3 Knowledge of basic communication skills and characteristics necessary for effective teaching/exercise leadership
4.B.4 Skill in increasing an individual's self confidence and ability to independently continue appropriate levels of physical activity
4.B.5 Skill in conveying information effectively
4.B.6 Skill in effective communication regarding potentially sensitive topics
4.B.7 Skill in listening and responding to client needs and concerns
4.B.8 Ability to maintain appropriate and effective relationships

C. Basic Business Principles

4.C.1 Knowledge of key marketing principles
4.C.2 Knowledge of the purpose and importance of identifying and meeting the needs of niche and target markets
4.C.3 Knowledge of basic financial management principles
4.C.4 Knowledge of principles and processes for providing customer and personal services – needs assessment, quality standards for services, and evaluation of customer satisfaction
4.C.5 Skill in using time management principles in the planning and execution of activities
4.C.6 Ability to price, promote, follow-up, and close sales of personal training services
4.C.7 Ability to maintain a systematic process of documenting services for bookkeeping and billing purposes
4.C.8 Ability to collect, record, and securely retain information/documentation for appropriate amounts of time