CSCS® EXAMINATION Detailed Content Outline SCIENTIFIC FOUNDATIONS	Cognitive Level			Total Items
	Recall	Application	Analysis	
1. EXERCISE SCIENCES	**15**	**26**	**7**	**48**
A. Apply Knowledge of **Muscle** Anatomy and Physiology				
1. Muscle anatomy (e.g., muscle group names, specific muscle names, muscle fiber/cell structure)				
2. Muscular dynamics involved during movement patterns (e.g., sliding filament theory, type of muscle action)				
3. Individual differences among various types of athlete (biological age, training age, biological sex)				
B. Apply Knowledge of **Neuromuscular** Anatomy and Physiology				
1. Neuromuscular anatomy (e.g., motor unit, muscle fiber type, muscle spindle, Golgi tendon organ)				
2. Neuromuscular responses to exercise (e.g., motor unit recruitment patterns, nerve conduction, summation)				
3. Individual differences among various types of athletes (biological age, training age, biological sex)				
C. Apply Knowledge of Basic Principles of **Biomechanics** Regarding Exercise Selection, Execution, and Sport Performance				
1. Kinematic principles of movement (e.g., anatomical planes of movement, joint angles, velocity)				
2. Kinetic laws and principles of movement (e.g., momentum, torque, power, work, force, center of gravity, impulse, center of pressure, force-velocity curve, force-time curve, isometric/isotonic/isokinetic, lever systems)				
3. Role of muscles in movement (e.g., agonist, antagonist, synergist, neutralizer, stabilizer)				
4. Individual differences among various types of athletes (biological age, training age, biological sex)				
D. Apply Knowledge of **Bone and Connective Tissue** (tendons and ligaments) Anatomy and Physiology				
1. Bone and connective tissue anatomy				
2. Bone and connective tissue responses to exercise and training				
3. Individual differences among various types of athletes (biological age, training age, biological sex)				
E. Apply Knowledge of **Bioenergetics and Metabolism**				
1. Characteristics of the energy systems				
2. Effects of manipulating training variables (e.g., mode, intensity, duration, volume and work:rest ratio) to target specific energy systems				
3. Individual differences among various types of athletes (biological age, training age, biological sex)				

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F. Apply Knowledge of **Neuroendocrine** Physiology				
1. Functions of hormones (e.g., testosterone, growth hormone)				
2. Neuroendocrine responses to exercise and training				
3. Individual differences among various types of athletes (biological age, training age, biological sex)				
G. Apply Knowledge of **Cardiopulmonary** Anatomy and Physiology				
1. Cardiopulmonary anatomy (e.g., structure of the heart, vascular system, lungs)				
2. Cardiopulmonary responses to exercise and training				
3. Individual differences among various types of athletes (biological age, training age, biological sex)				
H. Apply Knowledge of **Physiological Adaptations**				
1. Impact of resistance training on physiological systems (e.g., nervous system, skeletal muscle, energy systems)				
2. Impact of conditioning on physiological systems (e.g., energy systems, skeletal muscle, nervous system)				
I. Apply Knowledge of Integrated/Network Physiology				
1. Interplay among the physiological systems				
2. Performance planning and performance management (training, sport science, recovery, sleep, travel, mental performance, nutrition)				
3. Impact of fatigue (e.g., neuromuscular, metabolic) on performance				
4. Techniques and strategies for restoration				
J. Apply Knowledge of **Scientific Research and Statistics** in the Exercise Sciences				
1. Scientific research process (e.g., research design and basic statistics)				
2. PICOT approach (Population, intervention, comparison, outcome, time) to asking answerable questions				
3. Research evaluation criteria (e.g., reliability and validity of testing techniques and research design)				
4. Practical applications of research				

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	Recall	Application	Analysis	Total Items
2. SPORT PSYCHOLOGY	**6**	**12**	**2**	**20**
A. Apply Knowledge of the Psycho-physiological factors of performance				
1. Motivational theories (e.g., Self-determination, goal-orientation, achievement motivation)				
2. Mental skills (e.g., arousal/emotional regulation, attentional control, visualization/ imagery, reinforcement strategies, confidence building, and self-talk)				
3. The alignment of psychological and physiological factors				
4. Interpersonal relationships (e.g., coach-athlete relationship, team dynamics/ cohesion, leadership)				
B. Apply Knowledge of Athlete Mental Health and Wellness				
1. The psychological impact of setbacks (e.g., injury, athlete identity/ transitions, re-evaluation) and know when to refer				
2. The signs and symptoms of common mental health concerns (e.g., anxiety, stress, depression) and know when to refer				
3. The signs and symptoms associated with eating disorders and disordered eating and know when to refer				
3. NUTRITION	**3**	**6**	**3**	**12**
A. Apply Basic Knowledge of Nutritional Factors Affecting Health and Performance				
1. Nutrition related topics that are within scope of practice and when referral is needed				
2. Basic nutritional factors that affect muscular endurance, hypertrophy, strength, power, and aerobic endurance (e.g., hydration/fluid intake, energy balance, macronutrient timing and quality, supplementation)				
3. Impact of alcohol and drugs				
4. Differences between evidenced-based and unsupported approaches for altering body composition (e.g., Plate approach vs fad diets)				
B. Apply Basic Knowledge of Supplement Efficacy and Safety				
1. Lack of regulation of dietary supplements and third-party testing				
2. Benefits and risks of dietary supplement, ergogenic aids, and performance-enhancing drugs				
Totals for SCIENTIFIC FOUNDATIONS section:	**24**	**44**	**12**	**80**

CSCS® EXAMINATION Detailed Content Outline PRACTICAL / APPLIED	Cognitive Level			Total Items
	Recall	Application	Analysis	
1. PROGRAM DESIGN	**2**	**21**	**21**	**44**
A. Conduct Needs Analysis				
1. Evaluate the sport (movement, physiological, injury analysis)				
2. Review the athlete's history (injury history, training status) and primary training goals)				
3. Select assessments (screening, performance testing, and monitoring)				
4. Analyze and benchmark assessment results				
5. Communicate recommendations based on the needs analysis to stakeholders				
Based on the outcomes of a needs analysis, design training programs that maximize performance and minimize injury potential incorporating the following steps:				
B. Incorporate Various Training Methods and Modes				
1. Different types of physical preparation goals or outcomes (e.g., muscular endurance, hypertrophy, strength, power, energy system development)				
2. Different types of training methods and modes (e.g., resistance training, plyometric, speed/sprint, agility, mobility/flexibility)				
C. Select Exercises				
1. Exercises relevant to the qualities and capacities desired within the training period				
2. Exercises to minimize injury potential (e.g., tendon loading, collision preparation)				
3. Exercises relevant to available facility, equipment, and staff				
4. Exercises relevant to individual injured athlete adjustments				
D. Determine Exercise Order				
1. Order of exercises based on the session goals				
2. Order of exercises based on mechanical or metabolic interference (e.g., large to small muscle groups, speed of movement, alternating upper body exercises with lower body exercises)				
E. Determine Exercise Intensities				
1. Methods for assigning mechanical (external) load (e.g., a percent of the 1RM or the athlete's body weight, RM loads, RPE) based on training and session goals				
2. Methods for assigning metabolic (internal) load (e.g., Karvonen method)				
F. Determine Training Volumes (defined as sets x reps)				

CSCS® EXAMINATION Detailed Content Outline PRACTICAL / APPLIED	Cognitive Level			Total Items
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G. Determine Work:Rest Periods, Recovery and Unloading, and Training				
1. Determine work:rest periods between reps, sets, and exercises based on session goals				
2. Determine recovery periods between sessions (e.g., daily, weekly)				
3. Determine training frequency within a microcycle (e.g., training week)				
4. Determine recovery and unloading phases within the macrocycle (e.g., training year)				
H. Determine Exercise Progression (e.g., mode, intensity, duration, frequency, complexity)				
I. Identify Periodization Strategies				
1. Determine strategy based on demands of sport, athlete/team needs, training age, and training goals (e.g., linear, nonlinear)				
2. Determine strategy based on phase/period/cycle goals (e.g., off season, pre-season, in season)				
J. Design Programs for Athletes During the Injury/Reconditioning/Return to Play Period in Collaboration with the Interdisciplinary Team				
K. Communicate and discuss the program goals, design, and expected outcomes to stakeholders				
2. EXERCISE TECHNIQUE	**5**	**15**	**8**	**28**
A. Teach and Evaluate **Movement Preparation** (soft tissue and flexibility/mobility, PNF, CNS prep, dynamic stretching)				
1. Provide a demonstration or explanation of movement patterns and technique (e.g., body and limb positions, movement mechanics, breathing)				
2. Assess, cue, and modify based on arousal, focus, competency, and safety				
B. Teach and Evaluate **Resistance Training** Technique				
1. Free weight training equipment (e.g., barbells, dumbbells, kettlebells)				
a. Demonstrate or explain movement patterns and technique (e.g., body and limb positions, movement mechanics, breathing)				
b. Engage safety protocol based on athlete and equipment needs (e.g., spotting, set up)				
c. Assess, cue, and modify based on arousal, focus, competency, and safety				
2. Resistance machine (e.g., pulley, cam, hydraulic)				
a. Demonstrate or explain movement patterns and technique (e.g., body and limb positions, movement mechanics, breathing)				
b. Engage safety protocol based on athlete and equipment needs (e.g., set up)				
c. Assess, cue, and modify based on arousal, focus, competency, and safety				

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3. Alternative resistance equipment (e.g., sleds, logs, tires, flywheels, ropes, sandbags, medicine balls, resistance bands)				
a. Demonstrate or explain movement patterns and technique (e.g., body and limb positions, movement mechanics, breathing)				
b. Engage safety protocol based on athlete and equipment needs (e.g., set up)				
c. Assess, cue, and modify based on arousal, focus, competency, and safety				
4. Olympic Weightlifting and Derivatives (e.g., high pull, push jerk, power pull)				
a. Demonstrate or explain movement patterns and technique (e.g., body and limb positions, movement mechanics, breathing)				
b. Engage safety protocol based on athlete and equipment needs (e.g., set up)				
c. Assess, cue, and modify based on arousal, focus, competency, and safety				
C. Teach and Evaluate **Speed, Agility, and Plyometric** Technique (e.g., linear and multidirectional sprints, change of direction, hops, jumps, bounds)				
1. Demonstrate or explain movement patterns and technique (e.g., acceleration, deceleration, change of direction)				
2. Engage safety protocol based on athlete, environment, and equipment needs (e.g., set up)				
3. Assess, cue, and modify based on arousal, focus, competency, and safety				
D. Teach and Evaluate **Energy System Development** (Bioenergetics)				
1. Explain the purpose and the goals of the conditioning session including intensity and duration				
2. Observe individual athlete responses and adjust accordingly (e.g., modify recovery periods/modalities based on athlete competency and safety concerns)				
E. Teach and Evaluate **Restoration Techniques** (e.g., breathing, stretching, active recovery)				
1. Explain the purpose and goals of the restoration technique				
2. Facilitate the restoration activity				
3. PROGRAM IMPLEMENTATION	**3**	**12**	**7**	**22**
A. Coach athletes through training sessions				
1. Prepare for sessions, define roles and responsibilities, set expectations				
2. Apply knowledge of motor learning and skill development (e.g., internal/external cues, progression/regression, demonstrations)				
3. Use active observation and data collection to provide feedback and evaluate progress toward expectations				
4. Reflect on the session through debrief and evaluation of coaching effectiveness				

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B. Administer Testing and Implement Monitoring Procedures				
1. Determine equipment and protocols to assess physical characteristics (e.g., strength, power, speed, aerobic capacity) and monitor readiness (e.g., practice loads, game loads, HRV)				
2. Conduct testing and monitoring procedures (e.g., data collection and organization, warm-up, how to test, rest between trials, athlete readiness)				
C. Evaluate, Interpret, and Communicate Assessment Results				
1. Evaluate the validity of test implementation and results				
2. Analyze the results in accordance with program plan (e.g., trend analysis, descriptive statistics)				
3. Synthesize, communicate, and discuss results with stakeholders while maintaining information privacy				
4. Adjust the training program based on results and feedback from stakeholders				
4. ORGANIZATION AND ADMINISTRATION	**11**	**5**	**0**	**16**
A. Work within the strength and conditioning scope of practice following the NSCA Codes, Policies, and Procedures, collaborate with allied health professionals, and recognize when to refer.				
B. Implement organizational environment policies and procedures that are associated with the safe operation of the strength and conditioning facility (e.g., facility/equipment cleaning and maintenance, rules, staff responsibilities, scheduling, emergency procedures)				
C. Identify risks associated with safety, standard of care, professional practice and ways to reduce or minimize the risk of liability within the facility				
D. Recognize and respond to symptoms of unsafe training practices (e.g., overuse, overtraining and temperature-induced illness)				
Totals for PRACTICAL/APPLIED section:	**21**	**53**	**36**	**110**

CSCS SAMPLE QUESTIONS

1. Which of the following shoulder movements and planes of motion are associated with the upward movement phase of the side lateral shoulder raise exercise?

    A. flexion/transverse

    B. abduction/sagittal

    C. abduction/frontal

2. An untrained college-aged athlete begins a resistance training program. After training for three weeks, her strength increases dramatically. Which of the following is the most influential factor responsible for this improvement?

    A. decreased cross-sectional area of Type I fibers

    B. increased number of muscle fibers

    C. improved neuromuscular efficiency

3. What is the minimum amount of carbohydrates that a 132-lb (60-kg) competitive Olympic triathlete should consume on a daily basis?

    A. 120 g

    B. 480 g

    C. 960 g

4. When running, which of the following contributes the most to minimizing the braking effect of a heel foot strike?

    A. eccentric hip flexion

    B. concentric hip extension

    C. eccentric knee extension

5. Which of the following components of mechanical load is the least important for stimulating new bone formation?

    A. rest period

    B. magnitude

    C. rate of loading

Answers: (1) C (2) C (3) B (4) B (5) A