

## **Certified Strength and Conditioning Specialist Job Task Analysis Summary**

On behalf of the NSCA, ACS Ventures, LLC (ACS) conducted a job task analysis study (JTA) for the Certified Strength and Conditioning Specialist (CSCS) certification on October 8-9, 2018, in Colorado Springs, CO. The meeting was held over a 2-day period and involved twelve subject-matter experts (SMEs) from the various disciplines across the strength and conditioning community (i.e. college, professional, high school coaches, etc.). The purpose of this study was to review and update the detailed content outline (DCO) for the CSCS program.

The study was conducted in three phases. The first phase, a meeting with the panel of SMEs convened to discuss the expectations a CSCS was responsible for in an organizational framework. The second phase, NSCA and ACS worked together to construct a survey to be distributed to the CSCS professionals working in the field in order to gain feedback on the tasks listed in the DCO. In the third and final phase, the responses of the survey were collected and analyzed to determine importance of each task. These measures were then used to update the DCO of the CSCS examination.

New Detailed Content Outline (DCO) Date Effective: **January 1, 2020.**

- All exams administered **before** January 1, 2020, will follow the existing DCO.
- All exams administered **on or after** January 1, 2020, will follow the NEW DCO (Pages 2-14)
- It is possible to register for the CSCS examination and be studying from the old DCO but take the exam when the new DCO becomes active. Please be conscious and aware of this if you register for the exam in the Fall 2019.

### Changes to the CSCS Blueprint:

The CSCS DCO remained almost identical to the current one. Below are the changes made to both the Scientific Foundations (SF) and Practical Applied (PA) outline:

#### *CSCS SF Changes:*

1.J: Apply Knowledge of the Psychological Techniques Used to Enhance Training

Domain 2: Sport Psychology-added as a new domain; was 1.J in old outline

Domain 3: Nutrition; formerly Domain 2


#### *CSCS PA Changes:*


1.A: Teach and Evaluate Movement Preparation; formerly 1.F


1.G: Teach Spotting Procedures and Techniques: REMOVED as a Task and added as a subtask within 1.B


1.G: Teach and Evaluate Recovery Techniques; added to new outline


**Updated CSCS Scientific Foundations Detailed Content Outline (effective beginning January 1, 2020):**

 <p style="text-align: center;"><b>CSCS<sup>®</sup> EXAMINATION</b> <b>Detailed Content Outline</b> <b>SCIENTIFIC FOUNDATIONS</b> <i>(final version; approved January, 2020)</i></p>	Cognitive Level			Total Items
	Recall	Application	Analysis	
<b>1. EXERCISE SCIENCES</b>	<b>14</b>	<b>24</b>	<b>6</b>	<b>44</b>
A. Apply Knowledge of <b>Muscle</b> 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)				
B. Apply Knowledge of <b>Neuromuscular</b> 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)				
C. Apply Knowledge of Basic Principles of <b>Biomechanics</b> 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)				


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D. Apply Knowledge of <b>Bone and Connective Tissue</b> (tendons and ligaments) Anatomy and Physiology				
1. Bone and connective tissue anatomy				
2. Bone and connective tissue responses to exercise and training				
E. Apply Knowledge of <b>Bioenergetics and Metabolism</b>				
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				
F. Apply Knowledge of <b>Neuroendocrine</b> Physiology				
1. Functions of hormones (e.g., testosterone, growth hormone)				
2. Neuroendocrine responses to exercise and training				
G. Apply Knowledge of <b>Cardiopulmonary</b> Anatomy and Physiology				
1. Cardiopulmonary anatomy (e.g., structure of the heart, vascular system, lungs)				
2. Cardiopulmonary responses to exercise and training				
H. Apply Knowledge of <b>Physiological Adaptations</b> to Exercise, Training, and the Impact of Recovery Strategies				
1. Adaptations to metabolic conditioning				
2. Causes, signs, symptoms, and effects of unsafe training and detraining				
3. Sleep (e.g., sleep deprivation, disordered sleep)				


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4. Techniques and strategies for recovery				
I. Apply Knowledge of the Special Considerations of the <b>Differences among Athletes</b> (e.g., age, sex, training status, specific sport or activity)				
J. Apply Knowledge of <b>Scientific Research and Statistics</b> in the Exercise Sciences				
1. Understand Scientific process				
2. Read, review, and evaluate various sources of information				
3. Understand reliability and validity				

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<b>2. SPORT PSYCHOLOGY</b>	<b>6</b>	<b>11</b>	<b>2</b>	<b>19</b>
A. Apply Knowledge of Psychological Foundations of Performance				
1. Motivational theory and techniques (e.g., imagery techniques, reinforcement strategies, confidence, and positive self-talk)				
2. Attentional control and decision-making (e.g., focus, arousal management)				
B. Apply Knowledge of Motor Learning and Skill Acquisition Techniques (e.g., feedback, practice conditions, attention and focus, learning styles, instructional strategies, internal and external cuing)				
C. Recognize Indicators of Mental Health Issues in Athletes				
1. The psychological impact of injury in sport				
2. The signs, symptoms, and psychological impacts of common mental health conditions (e.g., anxiety, stress, depression)				
3. The signs, symptoms, and behaviors associated with eating disorders and disordered eating				
4. The signs and symptoms of substance misuse				
<b>3. NUTRITION</b>	<b>5</b>	<b>8</b>	<b>4</b>	<b>17</b>
A. Apply Basic Knowledge of Nutritional Factors Affecting Health				
1. Health-related application of nutrition concepts (e.g., food groups, food exchanges, glycemic index, caloric vs. nutrient dense foods)				


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2. Health factors associated with dietary choices (e.g., a high intake of cholesterol, triglycerides, and/or saturated fat, low intake of calcium and iron, food sensitivities and allergies, alternative nutritional approaches)				
3. Effects of hydration status and electrolyte balance/imbalance on health				
B. Apply Basic Knowledge of Nutrition to Maximize Performance				
1. Training/nutritional programs that produce specific changes in body composition (e.g., fat loss or lean body mass increase)				
2. Composition and timing of nutrient and fluid intake before, during, and after an exercise session or a sport event				
3. Nutritional factors that affect muscular endurance, hypertrophy, strength, and aerobic endurance				
4. Nutritional needs for various training and health status of athletes				
C. Apply Basic Knowledge of the Effects, Risks, and Alternatives of Common Supplements, Performance-Enhancing Substances, and Methods				
1. Ergogenic aids and dietary supplements (e.g., creatine, carbohydrate loading, caffeine)				
2. Performance-enhancing substances and methods (e.g., anabolic steroids and blood doping)				
3. Impact of alcohol and drugs on performance				
<b>Totals for SCIENTIFIC FOUNDATIONS section:</b>	<b>25</b>	<b>43</b>	<b>12</b>	<b>80</b>


**Updated CSCS Practical Applied Detailed Content Outline (effective January 1, 2020):**


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	Recall	Application	Analysis	
<b>1. EXERCISE TECHNIQUE</b>	<b>7</b>	<b>22</b>	<b>11</b>	<b>40</b>
A. Teach and Evaluate <b>Movement Preparation</b> (soft tissue and flexibility/mobility, PNF, CNS prep, dynamic stretching)				
1. Preparatory body limb and position (e.g., stance, posture, alignment)				
2. Execution of technique (e.g., body and limb positions, movement mechanics, breathing, focus, arousal)				
3. Cuing and coaching, monitoring for safety				
4. Assessment, correction, and modification of exercise technique				
B. Teach and Evaluate <b>Resistance Training</b> Exercise Technique				
1. Free weight training equipment:				
a. preparatory body and limb position (e.g., grip, stance, alignment)				
b. execution of technique (e.g., body and limb positions, movement mechanics, breathing, focus, arousal)				
c. spotting procedures and technique, cuing and coaching, monitoring for safety				
d. assessment, correction, and modification of exercise technique				
2. Resistance machines (e.g., pulley, cam, hydraulic, friction, air, tubing)				
a. preparatory body and limb position (e.g., grip, stance, alignment)				
b. execution of technique (e.g., body and limb positions, movement mechanics, breathing, focus, arousal)				
c. spotting procedures and technique, cuing and coaching, monitoring for safety				


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d. assessment, correction, and modification of exercise technique				
3. Alternative modes (e.g., core, stability, balance, calisthenic, body weight only)				
a. preparatory body and limb position (e.g., grip, stance, alignment)				
b. execution of technique (e.g., body and limb positions, movement mechanics, breathing, focus, arousal)				
c. assessment, correction, and modification of exercise technique				
4. Non-traditional implements (e.g., logs, tire-flipping, heavy ropes, kettle bells, heavy medicine balls)				
a. preparatory body and limb position (e.g., grip, stance, alignment)				
b. execution of technique (e.g., body and limb positions, movement mechanics, breathing, focus, arousal)				
c. assessment, correction, and modification of exercise technique				
C. Teach and Evaluate <b>Olympic Weight Lifting and Plyometric</b> Exercise Technique				
1. Preparatory body and limb position (e.g., stance, posture, alignment)				
2. Execution of technique (e.g., body and limb positions, movement mechanics, breathing, focus, arousal)				
3. Assessment, correction, and modification of exercise technique				
D. Teach and Evaluate <b>Speed/Sprint Technique</b> (e.g., resisted and assisted sprinting, speed-strength):				
1. Preparatory body and limb position (e.g., stance, posture, alignment)				
2. Execution of technique (e.g., body and limb positions, movement mechanics, breathing, focus, arousal)				
3. Assessment, correction, and modification of exercise technique				





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E. Teach and Evaluate <b>Agility</b> Technique (e.g., forward, backward and lateral movements; turn, transition, acceleration, and deceleration maneuvers)				
1. Preparatory body and limb position (e.g., stance, posture, alignment)				
2. Execution of technique (e.g., body and limb positions, movement mechanics, breathing, focus, arousal)				
3. Assessment, correction, and modification of exercise technique				
F. Teach and Evaluate <b>Energy Systems Development</b>				
1. Aerobic conditioning activities (e.g., treadmill, bicycle, rowing machine, stair stepper, elliptical trainer, walking, jogging, running, swimming)				
a. machine programming and setup				
b. preparatory body and limb position (e.g., stance, posture, alignment)				
c. execution of technique (e.g., body and limb positions, movement mechanics, breathing, focus, arousal)				
d. assessment, correction, and modification of exercise technique				
2. Anaerobic conditioning activities (e.g., conditioning drills, heavy rope training, intermittent training)				
a. execution of technique (e.g., body and limb positions, movement mechanics, breathing, focus, arousal)				
b. assessment, correction, and modification of exercise technique				

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G. Teach and Evaluate <b>Recovery Techniques</b> (e.g., hydrotherapy, sleep, hydration, soft tissue, compression, static stretching exercises)				
1. Preparatory body and limb position (e.g. stance, posture, alignment)				
2. Execution of technique (e.g., body and limb positions, movement mechanics, breathing, focus, arousal)				
3. Assessment, correction, and modification of exercise technique				
<b>2. PROGRAM DESIGN</b>	<b>2</b>	<b>18</b>	<b>18</b>	<b>38</b>
A. Conduct Needs Analysis				
1. Evaluation of the sport (movement, physiological injury analysis)				
2. Assessment of the athlete (training status, physical testing and evaluation, primary resistance training goal)				
<b><i>Based on the outcomes of a needs analysis, design training programs that maximize performance and minimize injury potential, incorporating the following steps:</i></b>				
B. Incorporate Various Training Methods and Modes				
1. Different types of training methods and modes (e.g., resistance, plyometric, speed/sprint, interval, agility, aerobic, flexibility)				
2. Combinations of various training methods and modes to reach a certain goal or outcome (e.g., muscular endurance, hypertrophy, strength, power, aerobic endurance)				
C. Select Exercises				
1. Exercises specific to movement patterns of a particular sport (e.g., an exercise and its application and effectiveness for a sport, an exercise and movements involved in a sport, an exercise and muscles used in sport)				

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2. Exercises (e.g., power, core, assistance, structural) based upon the type or number of the involved muscle group or groups (e.g., what exercise trains certain muscle(s); how to change an exercise to change the involved muscles)				
3. Exercises based upon the type of kinetic chain movement (e.g., open or closed)				
4. Exercises to minimize injury potential (e.g., hamstring versus quadriceps, upper body versus lower body)				
5. Exercises to promote recovery				
D. Apply the Principles of Exercise Order				
1. Order of exercises based on the training goal				
2. Variations in exercise orders (e.g., large to small muscle groups, alternating push with pull, alternating upper body exercises with lower body exercises)				
3. Variations in exercise modes (e.g., explosive training, strength training, warmup/workout/cooldown, energy system training prioritization)				
E. Determine and Assign Exercise Intensities (e.g., load, resistance, heart rate)				
1. Methods for assigning an exercise load (e.g., a percent of the 1RM or the athlete's body weight, RM loads, RPE) or exercise heart rate (e.g., a percent of maximum heart rate or functional capacity, the Karvonen method)				
2. Load or exercise heart rate based on the training goal (e.g., muscular endurance, hypertrophy, strength, power, aerobic/anaerobic endurance)				
F. Determine and Assign Training Volumes (defined as sets x reps)				
1. Outcomes associated with the manipulation of training volume				
2. Volume based on the training goal (e.g., muscular endurance, hypertrophy, strength, power, aerobic/anaerobic capacity)				

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G. Determine and Assign Work:Rest Periods, Recovery and Unloading, and Training				
1. Work:rest periods and recovery (e.g., muscular endurance, hypertrophy, strength, power, aerobic/anaerobic capacity)				
2. Training frequency (e.g., muscular endurance, hypertrophy, strength, power, aerobic/anaerobic capacity, exercise recovery)				
H. Determine and Assign Exercise Progression (e.g., mode, intensity, duration, frequency)				
I. Identify Periodization Models and Concepts and How to Apply Them				
1. Periodization (e.g., the periods/phases/cycles, the types of training programs associated with the phases/periods/cycles)				
2. Training variations based on a sport season (i.e., a certain training period, phase, or cycle for a specific sport season)				
3. A periodized program specific to the athlete's demands of a sport, position, and training level (e.g., annual plan)				
J. Design Programs for Athletes During the Injury/Reconditioning Period (e.g., assigning exercises for a given acute or chronic injury or condition in collaboration with allied health professionals)				

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<b>3. ORGANIZATION AND ADMINISTRATION</b>	<b>8</b>	<b>4</b>	<b>0</b>	<b>12</b>
A. Organizational Environment				
1. Determine the policies and procedures associated with the safe operation of the strength and conditioning facility (e.g., facility/equipment cleaning and maintenance, rules, scheduling, emergency procedures)				
2. Determine the primary duties and responsibilities of the members of the strength and conditioning staff				
3. Engage in effective communication and collaboration with team coaches, athletic trainers, sports medicine, support staff, administration, media				
B. Determine the Design, Layout, and Organization of the Strength and Conditioning Facility (e.g., flooring, ceiling height, mirror placement, ventilation, lighting, characteristics of the equipment) Based on Athletic Needs and Industry Safety Standards				
C. Professional Practice				
1. Identify and work within the scope of practice for the strength and conditioning staff				
2. Abide by the NSCA Codes, Policies, and Procedures				
3. Abide by standards and practices of relevant governing bodies related to the implementation of the strength and conditioning program				
4. Recognize and respond to symptoms of unsafe training practices (e.g., overuse, overtraining, temperature-induced illness)				
5. Recognize when to refer an athlete to and collaborate with allied health professionals (e.g., athletic trainer, physical therapist, physician, registered dietitian, sport psychologist)				
D. Identify Common Litigation Issues Associated with Organizational Environment, Physical Environment, and Professional Practice and Ways to Reduce or Minimize the Risk Liability Within the Facility				

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<b>4. TESTING, ONGOING MONITORING, AND DATA EVALUATION</b>	<b>3</b>	<b>11</b>	<b>6</b>	<b>20</b>
A. Select Appropriate Evidence-Based Tests to Maximize Test Reliability and Validity				
1. Tests based upon the unique aspects of an exercise classification, sport, sport position, health, and training status				
2. Test administration procedures that use equipment, personnel, and time efficiently				
B. Administer Testing and Implement Monitoring Protocols and Procedures to Ensure Reliable Data Collection and Safe Performance				
1. Testing and monitoring equipment and its proper use				
2. Testing and monitoring procedures (e.g., warm-up, how to test, proper rest between trials, athlete readiness)				
3. Testing to assess physical characteristics and workloads (e.g., anthropometrics, physiological and mechanical stress) and evaluate performance (e.g., muscular strength, power, aerobic/anaerobic capacity, muscular endurance, agility, speed, flexibility)				
C. Evaluate and Interpret Results				
1. Validity of test results				
2. Typical vs. atypical results based on a sport, sport position, and the individual				
3. Design or modification of the training program based on results to ensure safe performance (i.e., determine which outcome of training needs to be improved in a future program)				
<b>Totals for PRACTICAL/APPLIED section:</b>	<b>20</b>	<b>55</b>	<b>35</b>	<b>110</b>