

Domain 1

Advanced Sciences and Math • 11.55%

Knowledge of:

1. General chemistry concepts (e.g., nomenclature, balancing chemical equations, chemical reactions, ideal gas law, and pH)
2. Electrical principles (e.g., Ohms law, power, impedance, energy, resistance, and circuits)
3. Principles of radioactivity (e.g., radioactive decay, half-life, source strength, concentration, and inverse square law)
4. Storage capacity calculations
5. Rigging and load calculations
6. Ventilation and system design
7. Noise hazards
8. Climate and environmental conditions (e.g., Wet-bulb Globe Temperature [WBGT], wind chill, and heat stress)
9. Fall protection calculations
10. General physics concepts (e.g., force, acceleration, velocity, momentum, and friction)
11. Financial principles (e.g., cost-benefit analysis, cost of risk, life cycle cost, return on investment, and effects of losses)
12. Descriptive statistics (e.g., central tendency, variability, and probability)
13. Lagging indicators (e.g., incidence rates, lost time, and direct costs of incidents)
14. Leading indicators (e.g., inspection frequency, safety interventions, employee performance evaluations, training frequency, near miss, near hit, and close-call reporting)

Domain 2

Safety Management Systems • 17.22%

Knowledge of:

1. Hierarchy of hazard controls
2. Risk transfer (e.g., insurance and outsourcing – such as incident management or subcontracting)
3. Management of change
4. Hazard and risk analysis methods (e.g., preliminary hazard analysis, subsystem hazard analysis, hazard and operability analysis, failure mode and effects analysis, fault tree analysis, fishbone, what-if and checklist analysis, change analysis, energy trace and barrier [ETBS] analysis, and systematic cause analysis technique [SCAT])
5. Process safety management
6. Fleet safety principles (e.g., driver behavior, defensive driving, distracted driving, fatigue, and vehicle safety features)
7. Hazard Communication and Globally Harmonized System
8. Control of hazardous energy (e.g., lockout/tagout)
9. Excavation, trenching, and shoring
10. Confined space
11. Physical security
12. Fall protection
13. Machine guarding
14. Powered industrial vehicles (e.g., trucks, forklifts, and cranes)
15. Scaffolding

Skill to:

1. Use hazard identification methods
2. Assess and analyze risks (e.g., probability and severity)
3. Provide financial justification of hazard controls
4. Implement hazard controls
5. Monitor and reevaluate hazard controls
6. Conduct incident investigation (e.g., root causes, causal factors, data collection, analysis, and chain of custody)
7. Conduct inspections and audits
8. Evaluate cost, schedule, performance, and project risk

Domain 3

Ergonomics • 9%

Knowledge of:

1. Fitness for duty (e.g., fatigue and mental health)
2. Stressors (e.g., environmental, lights, noise, and other conditions)
3. Risk factors (e.g., repetition, force, posture, and vibration)
4. Work design
5. Material handling (e.g., manual, powered equipment, and lifting devices)
6. Work practice controls (e.g., job rotation, work hardening, and early symptom intervention)

Skill to:

1. Use qualitative and quantitative analysis methods (e.g., anthropometry and NIOSH lift equation)

Domain 4

Fire Prevention and Protection • 10.66%

Knowledge of:

1. Chemical (e.g., flash point and auto ignition)
2. Electrical (e.g., static electricity, surge, arc flash, ground fault circuit interrupter, and grounding and bonding)
3. Hot work (e.g., welding, cutting, and brazing)
4. Combustible dust
5. Fire science (e.g., fire pentagon, fire tetrahedron, upper and lower explosive limits)
6. Detection systems
7. Suppression systems, fire extinguishers, sprinkler types
8. Segregation and separation (e.g., flammable materials storage and ventilation)
9. Housekeeping

Domain 5

Emergency Response Management (ERM) • 9.57%

Knowledge of:

1. Emergency, crisis, disaster response planning (e.g., drills)
2. Workplace violence (e.g., shooting, bomb threat, vandalism, and verbal threats)

Domain 6

Industrial Hygiene and Occupational Health • 12.59%

Knowledge of:

1. Sources of biological hazards (e.g., viral, bacterial, parasitic, fungus, and mold)
2. Protocol for bloodborne pathogen control
3. Mutagens, teratogens, and carcinogens
4. Chemical hazards (e.g., sources, assessment, control strategies, symptoms, and target organs)
5. Exposure limits (e.g., Threshold Limit Value [TLV], Short-term exposure limits [STEL], Time-Weighted Average [TWA], Ceiling Limit, Immediately Dangerous to Life and Health [IDLH], and Action Level [AL])
6. Routes of entry (e.g., inhalation, ingestion, absorption, and injection)
7. Acute and chronic exposures (e.g., additive effect, synergistic effect, antagonistic effect, and potentiation effect)
8. Noise
9. Radiation
10. Heat and cold stress

Skill to:

1. Conduct exposure assessment

Domain 7

Environmental Management • 8.68%

Knowledge of:

1. Environmental hazards awareness (e.g., biological [mold], chemical, waste, and vermin)
2. Water (e.g., storm, waste, and best practices)
3. Air (e.g., quality and best practices)
4. Land and conservation (e.g., solid waste, recycling, and sustainability)
5. Hierarchy of conservation (e.g., reuse, recycle, and reduce)
6. Environmental management system standards
7. Waste removal, treatment, and disposal

Domain 8

Training, Education, and Communication • 12.35%

Knowledge of:

1. Adult learning theory and techniques
2. Presentation tools (e.g., computer-based and group meeting)
3. Safety culture/climate
4. Data collection, needs analysis, gap analysis, and feedback
5. Assessing competency

Domain 9

Law and Ethics • 8.38%

Knowledge of:

1. Legal liability
2. Ethical behavior (e.g., professional practice, audits, record keeping, sampling, standard writing, and BCSP Code of Ethics)
3. Protection of worker privacy (e.g., information)

Skill to:

1. Deal with unethical situations (e.g., employee putting others at risk)
2. Read and interpret regulations
3. Determine appropriate actions based on knowledge limitations (e.g., know when to get help)



EXAMINATION BLUEPRINT CHANGES IN 2019

Every five years, or more often if necessary, BCSP revalidates all certification examinations. During the revalidation process a new blueprint is created that reflects the consensus of the profession as to the key elements a minimally qualified candidate must possess to be deemed competent.

The CSP examination began its revalidation process in 2019 and a new blueprint was generated. The following is a synopsis of the changes:

- Overall, a significant amount of the general concepts identified in the current blueprint carried over to the new blueprint.
- Most of the domains increased in length with the addition of new knowledge and skill statements.
- Domains 2 and 5 decreased in length due to a small number of knowledge statements being combined or moved to other domains.
- The name of Domain 4 changed to increase the focus on the "Application of Key Safety Concepts," rather than strictly knowledge of these concepts.
- Skill statements were added to Domains 5, 6, 7, and 8, again increasing the focus on application, rather than simply knowledge of concepts.
- Domain 9 added knowledge of workers' compensation.
- The Domain weights (percentages) shifted slightly, with increases seen for Domains 1, 3, 5, 6, 7, and 8, and decreases seen for Domains 2 and 4.

The new CSP blueprint is tentatively expected to be effective by the fourth quarter 2019.

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Domain 1

Advanced Sciences and Math • 9.95%

Knowledge of:

1. Core concepts in anatomy and physiology
2. Core concepts in chemistry (e.g., organic chemistry, general chemistry, and biochemistry)
3. Core concepts in physics (e.g., forms of energy, weights, forces, and stresses)
4. Mathematics (e.g., geometry, algebra, trigonometry, finance and accounting, engineering, and economics)
5. Statistics for interpreting data (e.g., mean, median, mode, confidence intervals, probabilities, and pareto analysis)
6. Core research methodology
7. Microbiology (e.g., nanotechnology, waterborne pathogens, and bloodborne pathogens)

Skill to:

1. Calculate required containment volumes and hazardous materials storage requirements
2. Calculate statistics from data sources

Domain 2

Management Systems • 13.34%

Knowledge of:

1. Benchmarks and performance standards/metrics
2. How to measure, analyze, and improve organizational culture
3. Incident investigation techniques and analysis (e.g., causal factors)
4. Management of change techniques (prior, during, and after)
5. System safety analysis techniques (e.g., fault tree analysis, failure modes and effect analysis [FMEA], Safety Case approach, and Risk Summation)
6. The elements of business continuity and contingency plans
7. Types of leading and lagging safety, health, environmental, and security performance indicators
8. Safety, health, and environmental management and audit systems (e.g., ISO 14000, 45001, 19011, ANSI Z10)
9. Applicable requirements for plans, systems, and policies (e.g., safety, health, environmental, fire, and emergency action)
10. Document retention or management principles (e.g., incident investigation, training records, exposure records, maintenance records, environmental management system, and audit results)
11. Budgeting, finance, and economic analysis techniques and principles (e.g., timelines, budget development, milestones, resourcing, financing risk management options, return on investment, cost/benefit analysis, and role in procurement process)
12. Management leadership techniques (e.g., management theories, leadership theories, motivation, discipline, and communication styles)
13. Project management concepts and techniques (e.g., RACI charts, project timelines, and budgets)

Skill to:

1. Analyze and/or interpret data (e.g., exposure, release concentrations, and sampling data)
2. Apply management principles of authority, responsibility, and accountability
3. Compare management systems with benchmarks
4. Conduct causal factors analyses
5. Develop, implement, and sustain environmental, safety, and health management systems
6. Evaluate and analyze survey data
7. Perform gap analyses
8. Demonstrate business need via financial calculations (e.g., return on investment, engineering economy, and financial engineering)

Domain 3

Risk Management • 14.49%

Knowledge of:

1. Hazard identification and analysis methods (e.g., job safety analysis, hazard analysis, human performance analysis, and audit and causal analysis)
2. Risk analysis
3. Risk evaluation (decision making)
4. The risk management process
5. The costs and benefits of risk assessment process
6. Insurance/risk transfer principles

Skill to:

1. Apply risk-based decision-making tools for prioritizing risk management options
2. Calculate metrics for organizational risk
3. Conduct hazard analysis and risk assessment
4. Select risk treatment or controls using the hierarchy of controls
5. Explain risk management options and concepts to decision makers, stakeholders, and the public

Domain 4

Advanced Application of Key Safety Concepts • 14.69%

Knowledge of:

1. Principles of safety through design and inherently safer designs (e.g., designing out hazards during design phase, avoidance, elimination, and substitution)
2. Engineering controls (e.g., ventilation, guarding, isolation, and active vs. passive)
3. Administrative controls (e.g., job rotation, training, procedures, and safety policies and practices)
4. Personal protective equipment
5. Chemical process safety management (e.g., pressure relief systems, chemical compatibility, management of change, materials of construction, and process flow diagrams)
6. Redundancy systems (e.g., energy isolation and ventilation)
7. Common workplace hazards (e.g., electrical, falls, same level falls, confined spaces, lockout/tagout, working around water, caught in, struck by, excavation, welding, hot work, cold and heat stress, combustibles, laser, and others)
8. Facility life safety features (e.g., public space safety, floor loading, and occupancy loads)
9. Fleet safety principles (e.g., driver and equipment safety, maintenance, surveillance equipment, GPS monitoring, telematics, hybrid vehicles, fuel systems, driving under the influence, and fatigue)
10. Transportation safety principles (e.g., air, rail, and marine)
11. Materials handling (e.g., forklifts, cranes, hand trucks, person lifts, hoists, rigging, manual, and drones)
12. Foreign material exclusion (FME) and foreign object damage (FOD)
13. Hazardous materials management (e.g., GHS labels, storage and handling, policy, and security)
14. Multi-employee worksite issues (e.g., contractors and temporary or seasonal employees)
15. Sources of information on hazards and risk management options (e.g., subject matter experts, relevant best practices, published literature, and SDS)
16. The safety design criteria for workplace facilities, machines, and practices (e.g., UL, NFPA, NIOSH, FM, and ISO)
17. Tools, machines, practices, and equipment safety (e.g., hand tools, ladders, grinders, hydraulics, and robotics)
18. Workplace hazards (e.g., nanoparticles, combustible dust, heat systems, high pressure, radiation, silica dust, powder and spray applications, blasting, and molten metals)
19. Human performance

Skill to:

1. Calibrate, use, and maintain data logging, monitoring, and measurement equipment
2. Identify relevant labels, signs, and warnings
3. Interpret plans, specifications, technical drawings, and process flow diagrams

Domain 5

Emergency Preparedness, Fire Prevention, and Security • 10.59%

Knowledge of:

1. Emergency/crisis/disaster response planning/business continuity (e.g., nuclear incidents, natural disasters, terrorist attacks, chemical spills, fires, active violent attacks, and public utilities)
2. Fire prevention, protection, and suppression systems
3. The transportation and security of hazardous materials
4. Workplace violence and prevention techniques (violence on employees)

Skill to:

1. Manage active incidents (e.g., emergency, crisis, disaster, and incident command system)

Domain 6

Occupational Health and Ergonomics • 12.05%

Knowledge of:

1. Advanced toxicology principles (e.g., symptoms of an exposure, LD50, mutagens, teratogens, and ototoxins)
2. Carcinogens
3. Ergonomics and human factors principles (e.g., visual acuity, body mechanics, lifting, vibration, anthropometrics, and fatigue management)
4. How to recognize occupational exposures (e.g., hazardous chemicals, radiation, noise, biological agents, heat/cold, infectious diseases, nanoparticles, and indoor air quality)
5. How to evaluate occupational exposures (e.g., hazardous chemicals, radiation, noise, biological agents, heat/cold, infectious diseases, ventilation, nanoparticles, and indoor air quality), including techniques for measurement, sampling, and analysis
6. How to control occupational exposures (e.g., hazardous chemicals, radiation, noise, biological agents, heat/cold, ventilation, nanoparticles, infectious diseases, and indoor air quality)
7. Employee substance abuse
8. The fundamentals of epidemiology
9. Occupational exposure limits (e.g., hazardous chemicals, radiation, noise, biological agents, and heat)

Skill to:

1. Conduct exposure evaluation (e.g., chemicals, SDS, ergonomic, ventilation, and environment [calibrations and calculations])
2. Use sampling equipment
3. Interpret data from exposure evaluations (e.g., adjusted shift calculations, use correct sampling method, and use correct analytical method)

Domain 7

Environmental Management Systems • 7.38%

Knowledge of:

1. Environmental protection and pollution prevention methods (e.g., air, water, soil, containment, soil vapor intrusion, and waste streams)
2. How released hazardous materials migrate/interact through the air, surface water, soil, and water table
3. Sustainability principles
4. Waste water treatment plants, onsite waste water treatment plants, and public water systems
5. Registration, evaluation, authorization and restriction of chemicals (REACH) and restriction of hazardous substances (RoHS)

Skill to:

1. Use waste management practices (e.g., segregation and separation, containment, disposal, chain of custody, and policy)
2. Conduct hazardous waste operations (e.g., spill clean-up and remediation)

Domain 8

Training/Education • 10.18%

Knowledge of:

1. Education and training methods and techniques (e.g., classroom, online, computer-based, AI, and on-the-job training)
2. Training, qualification, and competency requirements
3. Methods for determining the effectiveness of training programs (e.g., determine if trainees are applying training on the job)
4. Effective presentation techniques

Skill to:

1. Perform training needs assessments
2. Develop training programs (e.g., presentation skills and tools)
3. Develop training materials
4. Conduct training
5. Assess training competency
6. Develop training assessment instruments (e.g., written tests and skill assessments) to assess training competency

Domain 9

Law and Ethics • 7.33%

Knowledge of:

1. Legal issues (e.g., tort, negligence, civil, criminal, contracts, and disability terminology)
2. Protection of confidential information (e.g., privacy, trade secrets, personally identifiable information, and General Data Protection Regulation [GDPR])
3. Standards development processes
4. The ethics related to conducting professional practice (e.g., audits, record keeping, sampling, and standard writing)
5. The relationship between labor and management
6. BCSP Code of Ethics
7. Workers' compensation (e.g., injured worker's compensation)

Skill to:

1. Interpret laws, regulations, and consensus codes and standards
2. Apply concepts of BCSP Code of Ethics