worldskills

Technical Description

Cyber Security

Skill 54

WorldSkills International, by a resolution of the Competitions Committee and in accordance with the Constitution, the Standing Orders, and the Competition Rules, has adopted the following minimum requirements for this skill for the WorldSkills Competition.

The Technical Description consists of the following:

1 Introduction

1.1 Name and description of the skill competition

1.1.1 The name of the skill competition is

Cyber Security

1.1.2 Description of the associated work role(s) or occupation(s)

In recent years there has been an explosive growth in online business transactions, the Internet of Things (IoT) and cloud computing. Simultaneously, IT has become an official and unofficial political tool, as well as a means of new types of warfare. Many countries now deliver essential services online, to the extent that citizens without access to IT may become isolated and disadvantaged. This growing collective and individual dependency on IT places a significant obligation on IT service providers to safeguard their systems and users from intentional and unintentional breaches to the security of data and whole systems. As a result, the importance of the Cyber Security Professional cannot be overstated.

A Cyber Security Professional works to protect an organization's computer systems networks, to ensure their robustness and prevent hackers from accessing and/or stealing sensitive information and data. The role typically involves configuring firewalls, IPS/IDS, server roles/services and web security solutions to protect confidential information.

A Cyber Security Professional also monitors security breaches and investigates violations. They may conduct penetration testing by simulating attacks to search for vulnerabilities in their networks before they can be exploited for malicious reasons. Their forensic tasks include gathering, preserving, processing, analysing, and presenting computer-related evidence to mitigate networks' vulnerability to criminal, fraud, and other hostile activities. They have a range of tactics, techniques, and procedures, using a full range of investigative tools and processes.

A Cyber Security Professional usually also supports organizations' disaster recovery plans, which describes the steps and procedures to restore proper function of an organization's IT systems and networks after a disaster or attack. These are of paramount importance, financially, reputationally, and for the continuation of essential services. Plans normally include preventative measures such as regular backing up of and transfer of data to an offsite location.

In a fast-moving sector, Cyber Security Professionals must stay one step ahead of potential cyberattacks. They must keep up with the latest methods attackers used to infiltrate computer systems, as well as with the new security technologies that can help organizations to counter these threats with robust systems and measures.

1.1.3 Number of Competitors per team

Cyber Security is a team skill with two Competitors in each team.

1.1.4 Age limit of Competitors

The Competitors must not be older than 25 years in the year of the Competition.

1.2 The relevance and significance of this document

This document contains information about the standards required to compete in this skill competition, and the assessment principles, methods, and procedures that govern the competition.

Every Expert and Competitor must know and understand this Technical Description.

In the event of any conflict within the different languages of the Technical Descriptions, the English version takes precedence.

1.3 Associated documents

Since this Technical Description contains only skill-specific information it must be used in association with the following:

- WSI – Code of Ethics and Conduct
- WSI – Competition Rules
- WSI – WorldSkills Occupational Standards framework
- WSI – WorldSkills Assessment Strategy
- WSI online resources as indicated in this document
- WorldSkills Health, Safety, and Environment Policy and Regulations
- WorldSkills Standards and Assessment Guide (skill-specific)

2 The WorldSkills Occupational Standards (WSOS)

2.1 General notes on the WSOS

The WSOS specifies the knowledge, understanding, skills, and capabilities that underpin international best practice in technical and vocational performance. These are both specific to an occupational role and also transversal. Together they should reflect a shared global understanding of what the associated work role(s) or occupation(s) represent for industry and business (www.worldskills.org/WSOS).

The skill competition is intended to reflect international best practice as described by the WSOS, to the extent that it can. The Standard is therefore a guide to the required training and preparation for the skill competition.

In the skill competition the assessment of knowledge and understanding will take place through the assessment of performance. There will only be separate tests of knowledge and understanding where there is an overwhelming reason for these.

The Standard is divided into distinct sections with headings and reference numbers added.

Each section is assigned a percentage of the total marks to indicate its relative importance within the Standards. This is often referred to as the “weighting”. The sum of all the percentage marks is 100. The weightings determine the distribution of marks within the Marking Scheme.

Through the Test Project, the Marking Scheme will assess only those skills and capabilities that are set out in the WorldSkills Occupational Standards. They will reflect the Standards as comprehensively as possible within the constraints of the skill competition.

The Marking Scheme will follow the allocation of marks within the Standards to the extent practically possible. A variation of up to five percent is allowed, if this does not distort the weightings assigned by the Standards.

2.2 WorldSkills Occupational Standards

Section		Relative importance (%)
1	**Work organization and management**	**5**
	The individual needs to know and understand: • Health and safety legislation, obligations, regulations, and documentation • The situations when personal protective equipment (PPE) must be used, e.g. for ESD (electrostatic discharge) • The importance of integrity and security when dealing with user equipment and information • The importance of safe disposal of waste for re-cycling • The techniques of planning, scheduling, and prioritizing • The significance of accuracy, checking, and attention to detail in all working practices	

Section		Relative importance (%)
	• The importance of methodical working practices.	
	The individual shall be able to: • Follow health and safety standards, rules, and regulations • Maintain a safe working environment • Identify and use the appropriate Personal Protective Equipment for ESD • Select, use, clean, maintain, and store tools and equipment safely and securely • Plan the work area to maximize efficiency and maintain the discipline of regular tidying • Work efficiently and check progress and outcomes regularly • Keep up-to-date with 'license to practice' requirements and maintain currency • Undertake thorough and efficient research methods to support knowledge growth • Update and maintain security policies as needs and the field evolves • Plan to optimize device usage and sustainability for clients • Proactively try new methods, systems, and embrace change • Safely and sustainably dispose of electronic data storage devices.	
2	**Communication and interpersonal skills**	**10**
	The individual needs to know and understand: • The importance of listening as part of effective communication • The roles and requirements of colleagues and the most effective methods of communication • The importance of building and maintaining productive working relationships with colleagues and managers • Techniques for effective teamwork • Techniques for resolving misunderstandings and conflicting demands • The process for managing tension and anger to resolve difficult situations • Requirements for the complete documentation of steps taken in cyber security investigations and the resulting discoveries.	
	The individual shall be able to: • Use strong listening and questioning skills to deepen understanding of complex situations • Ensure consistently effective verbal and written communications with colleagues • Recognize and adapt to the changing needs of colleagues • Proactively contribute to the development of strong and effective teams	

Section		Relative importance (%)
	• Share knowledge and expertise with colleagues and develop supportive learning cultures • Manage tension/anger and give individuals confidence that their problems can be resolved • Accurately document steps taken and findings in the course of investigations • Ensure policies and procedures for security and operation on information systems are carefully followed.	
3	**Secure systems design and creation**	**10**
	The individual needs to know and understand: • IT risk management standards, policies, requirements, and procedures • Cyber defence and vulnerability assessment tools and their capabilities • Operating Systems • Network systems • Computer programming concepts, including computer languages, programming, testing, debugging, and file types • The cyber security and privacy principles and methods that apply to software development.	
	The individual shall be able to: • Apply cyber security and privacy principles to organizational requirements (relevant to confidentiality, integrity, availability, authentication, nonrepudiation) when designing and documenting overall program Test & Evaluation procedures • Conduct independent comprehensive assessments of the management, operational, and technical security controls and control enhancements employed within or inherited by information technology (IT) systems to determine the overall effectiveness of controls • Develop and conduct assessments of systems to evaluate compliance with specifications and requirements • Secure the interoperability of systems or elements of systems incorporating IT • Analyse the security of new or existing computer applications, software, or specialized utility programs, to provide actionable results • Develop and maintain business, systems, and information processes, to support enterprise mission needs • Develop information technology (IT) rules and requirements that describe baseline and target architectures • Ensure that stakeholder security requirements necessary to protect the organization's mission and business processes are adequately addressed in all aspects of enterprise architecture, including reference models, segment and solution architectures, and the	

Section		Relative importance (%)
	resulting systems supporting those missions and business processes • Conduct software and systems engineering and software systems research to develop new capabilities, ensuring cyber security is fully integrated. • Conduct research (including penetration testing) to evaluate potential vulnerabilities in cyberspace systems • Consult with stakeholders to evaluate functional requirements and translate functional requirements into technical solutions • Plan, prepare, and execute tests of systems • Analyse, evaluate and report results against specifications and requirements • Design, develop, test, and evaluate information system security throughout the systems development life cycle.	
4	**Secure systems operation and maintenance**	**15**
	The individual needs to know and understand: • Query languages such as SQL (structured query language) and Database Systems. • Network protocols such as TCP/IP, Dynamic Host Configuration, Domain Name System (DNS), and directory services • Firewall concepts and functions (e.g., Single point of authentication/ audit/policy enforcement, message scanning for malicious content, data anonymization for PCI and PII compliance, data loss protection scanning, SSL security and REST/JSON processing) • Network security architecture concepts including topology, protocols, components, and principles • Systems administration, network, and operating system hardening techniques • Organizational information technology (IT) user security policies (e.g., account creation, password rules, and access control) • Information technology (IT) security principles and methods • Authentication, authorization, and access control methods • Cyber security vulnerability and privacy principles.	
	The individual shall be able to: • Install, configure, test, operate, maintain, and manage network infrastructure • Manage software that permits the sharing and transmission of all data • Install, configure, troubleshoot, and maintain server configurations (hardware and software) to ensure their confidentiality, integrity, and availability • Manage accounts in relation to access control, passwords, account creation, and administration	

Section		Relative importance (%)
	• Analyse organizations' computer systems and update information systems solutions to help them operate more securely, efficiently, and effectively • Develop methods to monitor and measure risk, compliance, and assurance efforts • Conduct audits of information technology (IT) programs, infrastructure network to provide ongoing optimization, cyber security and problem-solving support.	
5	**Secure systems protection and defence**	**15**
	The individual needs to know and understand: • File system implementations • System files (e.g., log files, registry files, configuration files) contain relevant information and where to find those system files • Network security architecture concepts including topology, protocols, components, and principles (e.g., application of defence-in-depth) • Industry-standard and organizationally accepted analysis principles, methods, and tools to identify vulnerabilities • Threat investigations, reporting, investigative tools, and laws/ regulations • Incident categories, response, and handling methodologies • Cyber defence and vulnerability assessment tools and their capabilities • Countermeasure design for identified security risks • Authentication, authorization, and access approaches (e.g. role-based access control, mandatory access control and discretionary access control).	
	The individual shall be able to: • Use defensive measures and information collected from a variety of sources to identify, analyse, and report events that occur or might occur within the network, to protect information, information systems, and networks from threats • Test, implement, deploy, maintain, review, and administer the infrastructure hardware and software that are required to effectively manage the computer network and resources • Monitor networks to actively remediate unauthorized activities • Respond to crises or urgent situations within own areas of expertise to mitigate immediate and potential threats • Use mitigation, preparedness, and response and recovery approaches, as needed, to maximize survival of life, preservation of property, and information security • Investigate and analyse all relevant response activities • Conduct assessments of threats and vulnerabilities • Determine deviations from acceptable configurations, enterprise, or local policy	

Section		Relative importance (%)
	• Assess the level of risk and develop and/or recommend appropriate mitigation countermeasures in operational and non-operational situations • Follow documented enterprise procedures for incident preparedness and response.	
6	**Operations and Management**	**20**
	The individual needs to know and understand: • Cyber threat actors and their methods • Methods and techniques used to detect various exploitation activities • Cyber intelligence/information collection capabilities and repositories • Cyber threats and vulnerabilities • The basics of network security (e.g., encryption, firewalls, authentication, honey pots, perimeter protection) • Vulnerability information dissemination sources (e.g., alerts, advisories, errata, and bulletins) • Which system files (e.g., log files, registry files, and configuration files) contain relevant information and where to find those system files • The structure, approach, and strategy of exploitation tools (e.g., sniffers, keyloggers) and techniques (e.g., gaining backdoor access, collecting/exfiltrating data, conducting vulnerability analysis of other systems in the network) • Internal tactics to anticipate and/or emulate threat capabilities and actions • Internal and external partner cyber operations capabilities and tools • Target development (i.e., concepts, roles, responsibilities, products, etc.) • System Artefacts and forensic use cases • Emerging exploitation or threats as they apply to installed systems and software • The importance of preparedness for recovery in cases of natural disaster.	
	The individual shall be able to: • Identify and assess the capabilities and activities of cyber security criminals or foreign intelligence entities • Produce findings to help initialize or support law enforcement and counterintelligence investigations or activities • Analyse collected information to identify vulnerabilities and potential for exploitation • Analyse threat information from multiple sources, disciplines, and agencies across the Intelligence Community • Synthesize and place intelligence information in context, draw insights about the possible implications	

Section		Relative importance (%)
	• Apply current knowledge of one or more regions, countries, non-state entities, and/or technologies • Apply language, cultural, and technical expertise to support information collection, analysis, and other cyber security activities • Identify, preserve, and use system artefacts for analysis • Execute successful data and systems recovery in case of loss.	
7	**Intelligence collection and analysis**	**10**
	The individual needs to know and understand: • Collection strategies, techniques, and tools • Cyber intelligence/information collection capabilities and repositories • Information needs and collection requirements are translated, tracked, and prioritized across the extended enterprise • Required intelligence planning products associated with cyber operational planning • Cyber operational planning programs, strategies, and resources. • Cyber operations strategies, resources and tools • Cyber operations concepts, terminology/lexicon (i.e., environment preparation, cyber-attack, cyber defence), principles, capabilities, limitations, and effects.	
	The individual shall be able to: • Execute collection using appropriate strategies and within the priorities established through the collection management process • Perform in-depth joint targeting and cybersecurity planning processes. • Gather information and develop detailed Operational Plans and Orders supporting requirements • Assist strategic and operational-level planning across the full range of operations for integrated information and cyberspace operations • Support activities to gather evidence on criminal or foreign intelligence entities to mitigate possible or real-time threats, protect against espionage or insider threats, foreign sabotage, international terrorist activities, or to support other intelligence activities.	
8	**Investigation and Digital Forensics**	**15**
	The individual needs to know and understand: • Threat investigations, reporting, investigative tools and laws/ regulations • Malware analysis concepts and methodologies • Processes for collecting, packaging, transporting, and storing electronic evidence while maintaining chain of custody • Types and collection of persistent data • Concepts and practices of processing digital forensic data	

Section		Relative importance (%)
	• Types of digital forensics data and how to recognize them • Forensic implications of operating system structure and operations • Specific operational impacts of cyber security lapses.	
	The individual shall be able to: • Trace important information through logs and other information sources to ascertain the chain of events making up the incident • Identify the processes by which an attack may have taken place to be able to evaluate the incident and the way infrastructure may be impacted • Deduce steps taken in an incident to identify any weaknesses existing in the systems • Give careful attention to detail to be able to spot and identify anomalies and patterns in data sets • Learn new techniques, tools and technologies as the field evolves • Collect, process, preserve, analyse, and present computer-related evidence in support of network vulnerability mitigation and/or criminal, fraud, counterintelligence, or law enforcement investigations.	
	Total	**100**

3 The Assessment Strategy and Specification

3.1 General guidance

Assessment is governed by the WorldSkills Assessment Strategy. The Strategy establishes the principles and techniques to which WorldSkills assessment and marking must conform.

Expert assessment practice lies at the heart of the WorldSkills Competition. For this reason, it is the subject of continuing professional development and scrutiny. The growth of expertise in assessment will inform the future use and direction of the main assessment instruments used by the WorldSkills Competition: the Marking Scheme, Test Project, and Competition Information System (CIS).

Assessment at the WorldSkills Competition falls into two broad types: Measurement and Judgement. For both types of assessment, the use of explicit benchmarks against which to assess each Aspect is essential to guarantee quality.

The Marking Scheme must follow the weightings within the Standards. The Test Project is the assessment vehicle for the skill competition, and therefore also follows the Standards. The CIS enables the timely and accurate recording of marks; its capacity for scrutiny, support, and feedback is continuously expanding.

The Marking Scheme, in outline, will lead the process of Test Project design. After this, the Marking Scheme and Test Project will be designed, developed, and verified through an iterative process, to ensure that both together optimize their relationship with the Standards and the Assessment Strategy. They will be agreed by the Experts and submitted to WSI for approval together, to demonstrate their quality and conformity with the Standards.

Prior to submission for approval to WSI, the Marking Scheme and Test Project will liaise with the WSI Skill Advisors for quality assurance and to benefit from the capabilities of the CIS.

4 Assessment Design and Practice

4.1 General guidance

This section describes the role and place of the Marking Scheme, how the Experts will assess Competitors' work as demonstrated through the Test Project, and the procedures and requirements for marking.

The Marking Scheme is the pivotal instrument of the WorldSkills Competition, in that it ties assessment to the standard that represents each skill competition, which itself represents a global occupation. It is designed to allocate marks for each assessed aspect of performance in accordance with the weightings in the Standards.

By reflecting the weightings in the Standards, the Marking Scheme establishes the parameters for the design of the Test Project. Depending on the nature of the skill competition and its assessment needs, it may initially be appropriate to develop the Marking Scheme in more detail as a guide for Test Project design. Alternatively, initial Test Project design can be based on the outline Marking Scheme. From this point onwards the Marking Scheme and Test Project should be developed together.

Section 2.1 above indicates the extent to which the Marking Scheme and Test Project may diverge from the weightings given in the Standards, if there is no practicable alternative.

For integrity and fairness, the Marking Scheme and Test Project are increasingly designed and developed by one or more Independent Test Project Designer(s) with relevant expertise. In these instances, the Marking Scheme and Test Project are unseen by Experts until immediately before the start of the skill competition, or competition module. Where the detailed and final Marking Scheme and Test Project are designed by Experts, they must be approved by the whole Expert group prior to submission for independent validation and quality assurance. Please see the Competition Rules for further details.

Experts and Independent Test Project Designers are required to submit their Marking Schemes and Test Projects for review, verification, and validation well in advance of completion. They are also expected to work with their Skill Advisor, reviewers, and verifiers, throughout the design and development process, for quality assurance and in order to take full advantage of the CIS's features.

In all cases a draft Marking Scheme must be entered into the CIS at least eight weeks prior to the Competition. Skill Advisors actively facilitate this process.

4.2 Assessment Criteria

The main headings of the Marking Scheme are the Assessment Criteria. These headings are derived before, or in conjunction with, the Test Project. In some skill competitions the Assessment Criteria may be similar to the section headings in the Standards; in others they may be different. There will normally be between five and nine Assessment Criteria. Whether or not the headings match, the Marking Scheme as a whole must reflect the weightings in the Standards.

Assessment Criteria are created by the person or people developing the Marking Scheme, who are free to define the Criteria that they consider most suited to the assessment and marking of the Test Project. Each Assessment Criterion is defined by a letter (A-I). **The Assessment Criteria, the allocation of marks, and the assessment methods, should not be set out within this Technical Description. This is because the Criteria, allocation of marks, and assessment**

methods all depend on the nature of the Marking Scheme and Test Project, which is decided after this Technical Description is published.

The Mark Summary Form generated by the CIS will comprise a list of the Assessment Criteria and Sub Criteria.

The marks allocated to each Criterion will be calculated by the CIS. These will be the cumulative sum of marks given to each Aspect within that Assessment Criterion.

4.3 Sub Criteria

Each Assessment Criterion is divided into one or more Sub Criteria. Each Sub Criterion becomes the heading for a WorldSkills marking form. Each marking form (Sub Criterion) contains Aspects to be assessed and marked by Measurement or Judgement, or both Measurement and Judgement.

Each marking form (Sub Criterion) specifies both the day on which it will be marked, and the identity of the marking team.

4.4 Aspects

Each Aspect defines, in detail, a single item to be assessed and marked, together with the marks, and detailed descriptors or instructions as a guide to marking. Each Aspect is assessed either by Measurement or by Judgement.

The marking form lists, in detail, every Aspect to be marked together with the mark allocated to it. The sum of the marks allocated to each Aspect must fall within the range of marks specified for that section of the Standards. This will be displayed in the Mark Allocation Table of the CIS, in the following format, when the Marking Scheme is reviewed from C-8 weeks. (Section 4.1 refers.)

		CRITERIA								TOTAL MARKS PER SECTION	WSSS MARKS PER SECTION	VARIANCE
		A	B	C	D	E	F	G	H			
STANDARDS SPECIFICATION SECTION	1	5.00								5.00	5.00	0.00
	2		2.00					7.50		9.50	10.00	0.50
	3								11.00	11.00	10.00	1.00
	4			5.00						5.00	5.00	0.00
	5				10.00	10.00	10.00			30.00	30.00	0.00
	6		8.00	5.00				2.50	9.00	24.50	25.00	0.50
	7			10.00				5.00		15.00	15.00	0.00
TOTAL MARKS		5.00	10.00	20.00	10.00	10.00	10.00	15.00	20.00	100.00	100.00	2.00

4.5 Assessment and marking

There is to be one marking team for each Sub Criterion, whether it is assessed and marked by Judgement, Measurement, or both. The same marking team must assess and mark all Competitors. Where this is impracticable (for example where an action must be done by every Competitor simultaneously, and must be observed doing so), a second tier of assessment and marking will be put in place, with the approval of the Competitions Committee Management Team. The marking teams must be organized to ensure that there is no compatriot marking in any circumstances. (Section 4.6 refers.)

4.6 Assessment and marking using Judgement

Judgement uses a scale of 0-3. To apply the scale with rigour and consistency, Judgement must be conducted using:

- benchmarks (criteria) for detailed guidance for each Aspect (in words, images, artefacts, or separate guidance notes). This is documented in the Standards and Assessment Guide.
- the 0-3 scale to indicate:
  - 0: performance below industry standard
  - 1: performance meets industry standard
  - 2: performance meets and, in specific respects, exceeds industry standard
  - 3: performance wholly exceeds industry standard and is judged as excellent

Three Experts will judge each Aspect, normally simultaneously, and record their scores. A fourth Expert coordinates and supervises the scoring, and checks their validity. They also act as a judge when required to prevent compatriot marking.

4.7 Assessment and marking using Measurement

Normally three Experts will be used to assess each Aspect, with a fourth Expert supervising. In some circumstances the team may organize itself as two pairs, for dual marking. Unless otherwise stated, only the maximum mark or zero will be awarded. Where they are used, the benchmarks for awarding partial marks will be clearly defined within the Aspect. To avoid errors in calculation or transmission, the CIS provides a large number of automated calculation options, the use of which is mandated.

4.8 The use of Measurement and Judgement

Decisions regarding the choice of criteria and assessment methods will be made during the design of the competition through the Marking Scheme and Test Project.

4.9 Skill assessment strategy and procedures

WorldSkills is committed to continuous improvement including reviewing past limitations and building on good practice. The following skill assessment strategy and procedures for this skill competition take this into account and explain how the marking process will be managed.

All Experts should be assigned to a module team. The Competitor's work may not be altered in any way to facilitate marking unless included in the Marking Scheme.

The Experts are divided into Marking groups within their module team to mark each specific section of the Assessment Criteria. There is progressive marking for all sections of the Competition.

Each module/section is completed on the assigned day so that progressive marking takes place.

Marking Scheme:

- Each Competitor is provided with the Mark Summary Form
- A full “how-to-Marking Scheme” will only be seen by the Experts. (Reason: The full Marking Scheme would give the answers to the Competitor.)

5 The Test Project

5.1 General notes

Sections 3 and 4 govern the development of the Test Project. These notes are supplementary.

Whether it is a single entity, or a series of stand-alone or connected modules, the Test Project will enable the assessment of the applied knowledge, skills, and behaviours set out in each section of the WSOS.

The purpose of the Test Project is to provide full, balanced, and authentic opportunities for assessment and marking across the Standards, in conjunction with the Marking Scheme. The relationship between the Test Project, Marking Scheme, and Standards will be a key indicator of quality, as will be its relationship with actual work performance.

The Test Project will not cover areas outside the Standards or affect the balance of marks within the Standards other than in the circumstances indicated by Section 2. This Technical Description will note any issues that affect the Test Project's capacity to support the full range of assessment relative to the Standards. Section 2.1 refers.

The Test Project will enable knowledge and understanding to be assessed solely through their applications within practical work. The Test Project will not assess knowledge of WorldSkills rules and regulations.

Most Test Projects and Marking Schemes are now designed and developed independently of the Experts. They are designed and developed either by the Skill Competition Manager, or an Independent Test Project Designer, normally from C-12 months. They are subject to independent review, verification, and validation. (Section 4.1 refers.)

The information provided below will be subject to what is known at the time of completing this Technical Description, and the requirement for confidentiality.

Please refer to the current version of the Competition Rules for further details.

5.2 Format/structure of the Test Project

The Test Project is a series of four (4) standalone modules.

5.3 Test Project design requirements

Test Projects should reflect the purposes, structures, processes, and outcomes of the occupational role they are based on. They should aim to be a small-scale version of that role. Before focusing on practicalities, SMTs should show how the Test Project design will provide full, balanced, and authentic opportunities for assessment and marking across the Standards, as set out in Section 5.1.

The four modules are:

- Enterprise Infrastructure Security;
- Cyber Security Incident Response, Digital Forensic Investigations, and Application Security;
- Blue Team Activities;
- Red Team Activities.

Each Test Project module must be:

- At a level that a Competitor can comfortably complete;
- The highest level of difficulty in the competition included modules must be less than or equal to the knowledge, skillsets, and abilities defined in the seven (7) cyber security functions stated in the WorldSkills Occupational Standards;
- Designed using a standard cover sheet for each section on the WorldSkills International template available on the website;
- Self-explanatory requiring minimal translation (Competitor instructions containing a minimum of text);
- Each module should have a detailed physical topology image followed by a detailed logical topology image;
- Be accompanied by a Marking Scheme that is finalized at the Competition in accordance with the Technical Description;
- All operating systems and other software used in the Competition are to be in English language versions.

5.4 Test Project coordination and development

The Test Project MUST be submitted using the templates provided by WorldSkills International (www.worldskills.org/expertcentre). Use the Word template for text documents and DWG template for drawings.

5.4.1 Test Project coordination (preparation for Competition)

Coordination of the Test Project/modules will be undertaken by the Skill Competition Manager.

5.4.2 Who develops the Test Project/modules

The Test Project/modules are developed by an Independent Test Project Designer (ITPD) in collaboration with the Skill Competition Manager.

5.4.3 When is the Test Project developed

The Test Project/modules are developed according to the following timeline:

Time	Action
Fifteen (15) months prior to the Competition	The ITPD is identified and a Confidentiality Agreement between WSI and the ITPD is organized.
Two (2) months prior to the Competition	The Test Project documents are sent to the WorldSkills International Skills Competitions Administration Manager.
At the Competition on the beginning of each module	The Test Project/modules are presented to Experts and Competitors.

5.5 Test Project initial review and verification

The purpose of a Test Project is to create a challenge for Competitors which authentically represents working life for an outstanding practitioner in an identified occupation. By doing this, the Test Project will apply the Marking Scheme and fully represent the WSOS. In this way it is unique in its context, purpose, activities, and expectations.

To support Test Project design and development, a rigorous quality assurance and design process is in place (Competition Rules sections 10.6-10.7 refer.) Once approved by WorldSkills, the Independent Test Project Designer (ITPD) is expected to identify one or more independent expert(s), and trusted individuals initially to review the Independent Test Project Designer's ideas and plans, and subsequently to verify the Test Project, prior to validation.

A Skill Advisor will ensure and coordinate this arrangement, to guarantee the timeliness and thoroughness of both initial review, and verification, based on the risk analysis that underpins Section 10.7 of the Competition Rules.

5.6 Test Project validation

The Skill Competition Manager coordinates the validation of the Test Project/modules and will ensure that it can be completed within the material, equipment, knowledge, and time constraints of Competitors.

5.7 Test Project circulation

The Test Project/modules are not circulated prior to the Competition. The Test Project/modules are presented to Experts and Competitors at the beginning of each module.

5.8 Test Project change

Due to the Test Project being developed by an Independent Test Project Designer (ITPD), there is no change required to be made to the Test Project/modules at the Competition. Exceptions are amendments to technical errors in the Test Project documents and according to infrastructure limitations.

5.9 Test Project translation and use of Interpreters

The Test Project documentation and the Mark Summary Form for this skill competition are translated into the language of the Competitors' choice using an approved AI platform. It is the responsibility of the Technical Delegate to request the translation, and in which language, via the official process managed by WSI.

The Secretariat will manage the process. **Refer to Competition Rule 10.12.**

The following applies:

- Interpreters may be present during the Test Project briefing for Competitors.
- Interpreters are allowed to be used for communication as per **Competition Rule 6.13.**
- Interpreters and Experts are not allowed to review the translated documents prior to their release as per section **5.4.3**

6 Skill management and communication

6.1 Discussion Forum

Prior to the Competition, all discussion, communication, collaboration, and decision making regarding the skill competition must take place on the WorldSkills skill-specific Discussion Forum. (http://forums.worldskills.org). Skill related decisions and communication are only valid if they take place on the WorldSkills Discussion Forum. The Chief Expert (or an Expert Lead appointed by the Skill Management Team) will be the moderator for this Discussion Forum. Refer to the Competition Rules for the timeline of communication and competition development requirements.

6.2 Competitor information

All information for registered Competitors is available from the Competitor Centre (www.worldskills.org/competitorcentre).

This information includes:

- Competition Rules
- Technical Descriptions
- Mark Summary Form (where applicable)
- Test Projects (where applicable)
- Infrastructure List
- WorldSkills Health, Safety, and Environment Policy and Regulations
- Other Competition-related information

6.3 Test Projects and Marking Schemes

Circulated Test Projects will be available from www.worldskills.org/testprojects and the Competitor Centre (www.worldskills.org/competitorcentre).

6.4 Day-to-day management

The day-to-day management of the skill competition during the Competition is defined in the Skill Management Plan that is created by the Skill Management Team. The Skill Management Team comprises the Skill Competition Manager, Chief Expert, and the Expert Leads. The Skill Management Plan is progressively developed in the six (6) months prior to the Competition and finalized at the Competition. The Skill Management Plan can be viewed in the Expert Centre (www.worldskills.org/expertcentre).

6.5 General best practice procedures

General best practice procedures clearly delineate the difference between what is a best practice procedure and skill-specific rules (section 9). General best practice procedures are those where Experts and Competitors CANNOT be held accountable as a breach to the Competition Rules or skill-specific rules which would have a penalty applied as part of the Issue and Dispute Resolution procedure including the Code of Ethics and Conduct Penalty System. In some cases, general best practice procedures for Competitors may be reflected in the Marking Scheme.

Topic/task	Best practice procedure
Final Test Projects	• Final Test Projects for all Competitors are backed up and made available to all Competitors at the conclusion of the competition.
Equipment failure	• In the occurrence of equipment failure Competitors must notify Experts immediately by raising their hand. Experts will take note of the time that the Competitor is not able to make use of their equipment. Any time lost due to equipment failure is provided to the Competitor at the end of the standard module time.
Familiarization Day	• During Familiarization Day Competitors cannot use the available time to work on or solve any tasks related to the Competition. Prior to completing familiarization all Competitors need to clean their respective computers removing all the files created/used to test the software. This includes the removal of all databases which have been created.
Breaks	• No extra time is given to Competitors who stop work during competition time to go to the bathroom or for those who break for food and/or drink. When time is completed all Competitors must stop all work on their computer immediately.

7 Skill-specific safety requirements

7.1 Personal Protective Equipment

Refer to WorldSkills Safety Policy and Regulations for Host country or region regulations.

Task	Sturdy shoes with closed toe and no heel
General PPE for safe areas	√

8 Materials and equipment

8.1 Infrastructure List

The Infrastructure List details all equipment, materials, and facilities provided by the Competition Organizer.

The Infrastructure List is available at www.worldskills.org/infrastructure.

The Infrastructure List specifies the items and quantities requested by the Skill Management Team for the next Competition. The Competition Organizer will progressively update the Infrastructure List specifying the actual quantity, type, brand, and model of the items. Note that in some cases details of specific materials and/or manufacturer specifications may remain secret and will not be released prior to the Competition. These items may include those for fault finding modules or modules not circulated.

At each Competition, the Skill Management Team must review and update the Infrastructure List in preparation for the next Competition. The Skill Competition Manager must advise the Director of Skills Competitions of any increases in space and/or equipment.

At each Competition, the Technical Observer must audit the Infrastructure List that was used at that Competition for the upcoming WorldSkills Competition.

The Infrastructure List does not include items that Competitors and/or Experts are required to bring and items that Competitors are not allowed to bring – they are specified below.

8.2 Material or manufacturer specifications

Specific material and/or manufacturer specifications required to allow the Competitor to complete the Test Project will be supplied by the Competition Organizer and are available from www.worldskills.org/infrastructure located in the Expert Centre. However, note that in some cases details of specific materials and/or manufacturer specifications may remain secret and will not be released prior to the Competition. These items may include those for fault finding modules or modules not circulated.

8.3 Competitors toolbox

Competitors are not allowed to send a toolbox to the Competition. All tools are provided by the Competition Organizer.

8.4 Materials, equipment, and tools supplied by Competitors

It is not applicable for Competitors to bring materials, equipment, and tools to the Competition.

8.5 Materials, equipment, and tools supplied by Experts

Experts are required to supply their own Personal Protective Equipment as specified in section 7 skill-specific safety requirements.

Experts are responsible that Interpreters bring their own PPE.

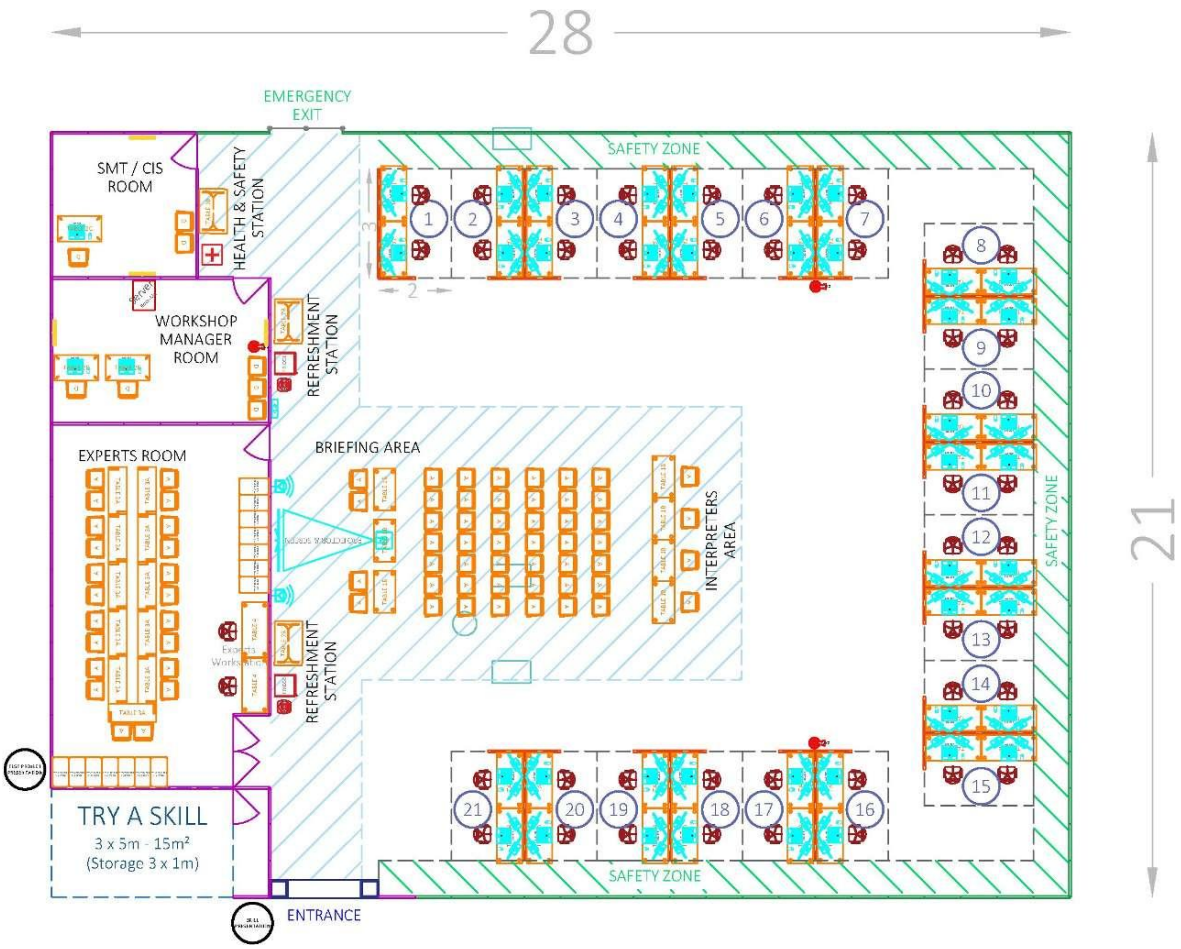
8.6 Materials and equipment prohibited in the skill area

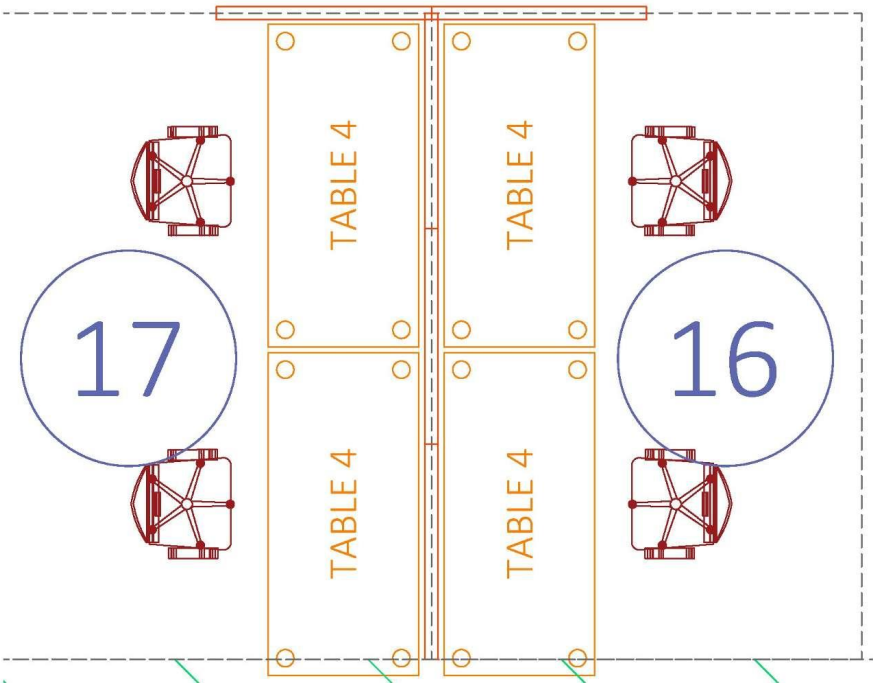
Competitors and Experts are prohibited to bring any materials or equipment not listed in section 8.3 and section 8.4.

8.7 Proposed workshop and workstation layouts

Workshop layouts from previous competitions are available at www.worldskills.org/sitelayout.

Example workshop layout





9 Skill-specific rules

9.1 General notes

Skill-specific rules cannot contradict or take priority over the Competition Rules. They do provide specific details and clarity in areas that may vary from skill competition to skill competition. This includes but is not limited to personal IT equipment, data storage devices, Internet access, procedures and workflow, and documentation management and distribution. Breaches of these rules will be solved according to the Issue and Dispute Resolution procedure including the Code of Ethics and Conduct Penalty System.

9.2 Skill-specific rules

Topic/task	skill-specific rule
Use of technology – USB, memory sticks	• Chief Expert and Experts are not allowed to bring personal USB/ memory sticks into the Expert meeting room or into the workshop. If these are brought, they must remain in the lockers provided during competition time. Personal USB/memory sticks are only allowed to be taken outside of the meeting room outside of competition time (i.e. lunch/after competition). • Competitors are not allowed to bring USB/memory devices into the workshop. If these devices are brought in they must be kept in Competitor's personal lockers. USB/memory sticks are allowed to be taken out of the workshop outside of competition time (i.e. lunch/after competition). • Interpreters are not allowed to bring personal USB sticks or memory devices into the competition or Interpreters area. If these devices are brought in they must be kept in personal lockers. USB/memory sticks are allowed to be taken out of the workshop outside of competition time (i.e. lunch/after competition). • If memory devices are required in the competition area, these are supplied by the Competition Organizer and access to them controlled by the Chief Expert. • The Skill Competition Manager is exempt from this rule.
Use of technology – personal laptops	• Skill Competition Manager, Chief Expert, Experts, and Competitors are not allowed to bring personal laptops into the competition area. If these are brought, they must remain in the lockers provided during competition time. Personal laptops, provided they have never been outside of lockers, may be removed at end of day or lunch breaks. If laptops are required for the operation of the competition or assessment, laptops (with wireless disabled) are supplied by the Competition Organizer and access to these laptops is controlled by the Chief Expert. • Interpreters may use personal laptops for translation, but these must stay in the workshop in the personal lockers when not in use for the duration of the competition.
Use of technology –	• Chief Expert and Experts are not allowed to bring cameras into the workshop unless their use has been approved by the SCM or Chief

Topic/task	skill-specific rule
personal cameras	Expert. If these devices are brought into the workshop they are to be stored in the personal lockers and are allowed to be removed outside of preparation and competition times (i.e. lunch and end of day). • Competitors are not allowed to have cameras in the workshop until the completion of competition on day four (C4). If these devices are brought into the workshop they are to be stored in personal lockers and are allowed to be taken outside of the lockers outside of competition times (i.e. lunch and end of day). • Interpreters are not allowed to bring cameras into the competition area unless their use has been approved by a member of the Skill Management Team. If these devices are brought into the workshop they are to be stored in the personal lockers and are allowed to be removed outside of preparation and competition times (i.e. lunch and end of day). • The Skill Competition Manager is exempt from this rule.
Use of technology – mobile devices (tablets, phones, etc.)	• Chief Expert and Experts may have personal mobile devices in the competition area, but no electronic devices are to be used at any Competitor's workstations under any circumstances unless with the approval of the Chief Expert. • Competitors – Electronic devices (Including mobile phones) must stay in Competitor personal locker (switched off or on silent). No electronic devices are to be brought to Competitors workstations under any circumstances unless with the approval of either the Chief Expert. Competitors are allowed to take phones out of their lockers outside of competition time (lunch and end of day).
Source file/ notes	• Competitors – No notes may be brought into the workshop under any circumstances. All notes made at the Competitor workstation must remain on the Competitors desk at all times. No notes may be taken outside of the workshop.
Test Project	• The "pre" and "final" Test Projects, in whole or in part, once released, should not be copied, photographed, or taken outside of the competition area in hard copy by anyone under any circumstances for the duration of the competition. This includes all Experts, Interpreters, Competitors, Skill Competition Manager and Chief Expert.

10 Expert knowledge and experience

10.1 Requirements

Experts appointed for this skill competition must have the following knowledge and experience for the appropriate occupation or work role as documented in **section 1.1.2**.

This section is currently under development for WSC2026.

11 Visitor and media engagement

11.1 Engagement methods

Following is a list of possible ways to maximize visitor and media engagement:

- Monitors with demonstrations/screen recordings of cyber security tasks being performed;
- Display screens showing a presentation on what competitors are currently working on;
- Enhanced understanding of Competitor activity;
- Career opportunities.

12 Sustainability

12.1 Sustainable practices

This skill competition will focus on the sustainable practices below:

- Recycling – No printing for Competitor workstations;
- No printing of Test Projects, unless required for translated versions. Test Projects are provided within media files.
- Use of completed Test Projects after Competition;
- Limit the amount of software to be installed on Competitor workstations;
- Use of open source software.

13 References for industry consultation

13.1 General notes

WorldSkills is committed to ensuring that the WorldSkills Occupational Standards fully reflect the dynamism of internationally recognized best practice in industry and business. To do this WorldSkills approaches a number of organizations across the world that can offer feedback on the draft Description of the Associated Role and WorldSkills Occupational Standards on a two-yearly cycle.

In parallel to this, WSI consults three international occupational classifications and databases:

- ISCO-08: (http://www.ilo.org/public/english/bureau/stat/isco/isco08/)
- ESCO: (https://ec.europa.eu/esco/portal/home)
- O*NET OnLine (www.onetonline.org/)

13.2 References

This WSOS appears most closely to relate to an Information Security Analyst: https://www.onetonline.org/link/summary/15-1122.00

or an ICT Security Technician: http://data.europa.eu/esco/occupation/a44a1dc5-be08-4840-8bd5-770c4ac1ca6d .

Adjacent occupations can also be explored through these links.

A junior version of ILO 2529..

The following table indicates which organizations were approached and provided valuable feedback for the Description of the Associated Role and WorldSkills Occupational Standards in place for WorldSkills Shanghai 2026.

Organization	Contact name
i-Sprint Innovations	Dutch Ng, CEO

14 Appendix

14.1 Appendix information

Not applicable.