WorldSkills Standards Specification

Information Network Cabling

Information and Communication Technology

worldskills

THE WORLDSKILLS STANDARDS SPECIFICATION (WSSS)

GENERAL NOTES ON THE WSSS

The WSSS specifies the knowledge, understanding, and specific skills that underpin international best practice in technical and vocational performance. It should reflect a shared global understanding of what the associated work role(s) or occupation(s) represent for industry and business (www.worldskills.org/WSSS).

The skill competition is intended to reflect international best practice as described by the WSSS, and to the extent that it is able to. The Standards Specification 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 Standards Specification 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 Specification. This is often referred to as the "weighting". The sum of all the percentage marks is 100.

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

The Marking Scheme and Test Project will follow the allocation of marks within the Standards Specification to the extent practically possible. A variation of five percent is allowed, provided that this does not distort the weightings assigned by the Standards Specification.

WORLDSKILLS STANDARDS SPECIFICATION

SECTION		RELATIVE IMPORTANCE (%)
1	**Work organization and management**	5
	The individual needs to know and understand: • Health and safety legislation, obligations, regulations, and documentation • Basic first aid • The negative impacts on businesses and organisations of poor or unreliable network installations • The situations when personal protective equipment (PPE) must be used, e.g. for ESD (electrostatic discharge) • The correct procedures for working with laser technologies • The purposes, uses, care, maintenance, safe handling, and storage of equipment in an ESD friendly environment • The importance of integrity and security when dealing with user equipment and information • The importance of safe disposal of waste for re-cycling • The significance of accuracy, checking, and attention to detail in all working practices • The importance of methodical working practices • Research methods and techniques • The value of managing own continuing professional development	
	The individual shall be able to: • Follow health and safety standards, rules, and regulations • Maintain a safe working environment including the use of ladders for access to high work • Use personal protective equipment correctly • 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 • Regularly schedule and re-schedule and multi-task according to changing priorities • Work efficiently and check progress and outcomes regularly • Be actively working towards fulfilling industry certification requirements and keep up-to-date with 'license to practice' requirements (determined by their own country) and to complete regular Continued Professional Development (CPD) • Demonstrate thorough and efficient research methods to support knowledge growth • Demonstrate enthusiasm to try new methods, systems and embrace change	

2	Communication and interpersonal skills	5
	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 team work • Techniques for resolving misunderstandings and conflicting demands • The process for managing tension and anger to resolve difficult situations	
	The individual shall be able to: • Demonstrate strong listening and questioning skills to deepen understanding of complex situations • Manage consistently effective verbal and written communications with colleagues • Pro-actively contribute to the development of a strong and effective team • Share knowledge and expertise with colleagues and develop a supportive learning culture • Manage tensions and anger in others, providing confidence that problems can be resolved • Discuss customer's requirements and provide Expert advice and consultancy • Liaise with other professional and suppliers to create a fully tailored package that fulfils the customer's needs • Respect the impact that cabling activity can have on a busy working environment, show consideration and care, causing least disruption always • Prepare quotations for planned work and present to customers	

3	Planning and design	5
	The individual needs to know and understand: • Campus and building cabling systems including backbone and horizontal • FTTH system, Data centre cabling system • Residential and office cabling systems • Outside plant cabling system • Wi-Fi applications • Network applications for CCTV, security, home automation • Network equipment • PoE • Smart home applications • Industry accepted terminology and symbols used in specifications and drawings • Principles of technical drawings and specifications that are recognized by the industry • The techniques of planning, scheduling, and prioritizing • Specialist terminology and symbols used in network cabling • Various types of information network technology and their applications including Ethernet technology, local area networks (LAN) technology • Mathematics and physics • The laws of electricity	
	The individual shall be able to: • Have strong problem-solving skills • Work independently by planning, ordering and prioritizing work to maximize efficiency and to adhere to planned time schedules • Schedule work required to achieve a given outcome • Prepare, design, interpret, and analyse specialist's technical drawings and specifications • Select the tools and systems that are most appropriate for the planned task • Select the appropriate cabling media based on usage requirements • Assess work sites to effectively identify risks and thereby prevent or minimize hazards • Assess buildings and plan the location of cables to minimize damages, unsightliness, and risks • Read, understand, and apply manufacturers' instructions • Interpret and analyse complex plans and specifications • Design IP network system (Wi-Fi, Smart applications, etc.) • Maintain equipment and tools	

4	Cabling	10
	The individual needs to know and understand: • The different types of cable, their characteristics, uses, and how they affect other aspects of the network	
	The individual shall be able to: • Install cable setup • Install and pull cables, install rack cabinets, patch panels, and network equipment • Select the appropriate procedure for cabling • Prioritize work and comply with plans to minimize disruption and to meet agreed time scales • Clean the area after completing installation • Organize and label cabling to make future reconfiguring straightforward • Respect the client's building, keeping it tidy and clean	
5	Optical fibre structured cabling system	20
	The individual needs to know and understand: • Optical fibre cables and connecting hardware • Optical fibre cable classification • The uses of various connectors for optical fibre cables • Planning processes for optical fibre structured systems • Processes for installing optical fibre cables • The cabling appropriate for commercial and domestic use	
	The individual shall be able to: • Install and optical fibre structured cabling system and FTTH system (Closure/Panel/Splice box/TO etc.) • Connect and terminate optical fibre cables (Fusion splicing/Mechanical splicing/Optical connector/Installable optical connector) • Optical fibre cable preparation • Proper storage for cabling media	
6	Copper structured cabling system	20
	The individual needs to know and understand: • Copper cabling systems • Types and uses of different types of copper • Cable connecting hardware • How to plan for and install cable	
	The individual shall be able to: • Install and copper structured cabling systems (Rack/Panel /TO/Network equipment, etc.) • Install and terminate copper cables (Unshielded Twisted Pair (UTP) cable/Shielded Twisted Pair/Coaxial Cable) • Copper cable preparation (remove jacket, etc.) • Use copper insulation displacement (IDC) termination to terminate RJ45 modular jack (U/UTP, SF/UTP, S/FTP), terminate RJ45 modular plug	

7	Smart home technologies Home wireless connectivity	10
	The individual needs to know and understand: • IEEE802.11 series • Smart home applications • Home network equipment	
	The individual shall be able to: • Install and basic configuration to provide office/home connectivity • Set-up a Wi-Fi system • Install smart application and equipment • Install and configuration of active equipment (IP camera/TV/etc.)	
8	Troubleshooting and ongoing maintenance	10
	The individual needs to know and understand: • Where potential system faults may occur • Potential disruption to business activity resulting from system faults	
	The individual shall be able to: • Identify, locate, and diagnose system faults • Rectify faults • Replace and reinstall Optical fiber cabling, copper cabling • Carry-out Wi-Fi network fault-finding. • Install updates to ensure systems meet emerging business needs • Provide expert advice and guidance on use of the system, its features, and limitations • Thoroughly fill out the troubleshooting and fault-finding log sheet.	
9	Measurement	15
	The individual needs to know and understand: • The principles and purposes of measuring devices • The practical uses of measuring devices • The purpose of measurement	
	The individual shall be able to: • Inspect and clean installed cabling and rectify if necessary • Certify optical fibre cables by Optical loss test set (OTLS)/Optical time domain reflect metre (OTDR) • Certify copper cable by cable/LAN tester • Certify/Verify quality of fibre optical connector end-faces • Optimize performance of 802.11 wireless network • Select appropriate test equipment	
	Total	100

REFERENCES FOR INDUSTRY CONSULTATION

WorldSkills is committed to ensuring that the WorldSkills Standards Specifications 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 Standards Specification 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.**oneto**nline.org/)

This WSSS (Section 2) most closely to relate to *Telecommunication Line Installers and Repairers:*

https://www.onetonline.org/link/summary/49-9052.00.This link also enables adjacent occupations to be explored.