WorldSkills Standards Specification

Polymechanics and Automation

Manufacturing and Engineering Technology

worldskills

 WSC2019_WSSS01

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**	**15**
	The individual needs to know and understand: • Health and safety legislation and best practice • The range and uses of trade related machinery • How to use and operate machine tools safely • Specific safety issues relating to working with air and fluids • Specific safety issues relating to work involving electricity • Specific safety issues relating to work involving cutting tools • The importance of working logically and in a well-organized manner • The financial and business implications of faulty engineering equipment or plant • The importance of listening as part of effective communications	
	The individual shall be able to: • Consistently apply and promote health and safety legislation and best practice and work in a safe manner on a worksite • Operate trade machinery effectively, safely, and in accordance with manufacturers' instructions • Select and use appropriate machine tools safely and effectively • Select and use appropriate trade related cutting tools including air and fluids • Work within regulations and best practice when working with electricity • Plan and prioritize own work and work of others to maximize efficiency and to meet prescribed timescales • Demonstrate strong listening and questioning skills to deepen understanding of complex situations	
2	**Engineering manufacturing process**	**35**
	The individual needs to know and understand: • How to interpret engineering drawings (ISO standards) • Terminology and symbols used in engineering drawings and specifications • How parts are produced using engineering machine tools such as milling, turning, and grinding • Feeds and speeds to operate machinery • Types and characteristics of materials used in the manufacturing industry • Ferrous • Non-ferrous • Composites • Principles of pneumatics in automation projects	

	The individual shall be able to: • Understand, interpret, and analyze engineering drawings supplied on both ISO E or ISO A standard formats • Explain content and implications of engineering drawings to others • Properly use information contained in engineering drawings to inform planned work • Manufacture parts in regard to supplied drawings using the most appropriate methods, materials, and tools to specified tolerances • Manufacture engineering parts by using processes of milling, grinding, and turning • Select appropriate materials for a given task • Manufacture parts from materials used in the manufacturing industry – ferrous, non-ferrous and composite materials • Manufacture parts to specific tolerances • Effectively use precision engineering measuring tools • Demonstrate the use feeds and speeds effectively while operating engineering machinery • Produce systems using pneumatics	
3	**Manufacturing assembly principles**	**30**
	The individual needs to know and understand: • Mechanical systems principles and operations in order to support fault finding and diagnosis • Principles of pneumatics in manufacturing plant in order to support fault finding and diagnosis • Procedures and order for assembly of engineering parts, either supplied or self-manufactured • How to interpret and understand manufacturers' instructions for supplied parts and engineering plant	
	The individual shall be able to: • Assemble self-manufactured and supplied engineering components • Read, interpret and follow manufacturer's instructions for supplied engineering parts and plant • Locate and diagnose faults in engineering machinery and plant • Explain faults to other professionals, describing the cause, implication, and remedy • Using specialist technical knowledge and expertise, remove, or repair faults • Following appropriate investigation and consideration, find, and apply innovative solutions to difficult challenges • Provide Expert advice and guidance on ongoing use and maintenance of engineering plant and machinery to avoid or minimize future faults	

4	**Electrical principles and plant and automation control systems**	**20**
	The individual needs to know and understand: • Principles of electricity and its use in a manufacturing setting • Principles behind electrical wiring circuits in automation and PLC control systems • Electrical and programme logic controller (PLC) systems and their use in automation and the manufacturing process • Programming of PLC systems • Commissioning an automation project • Fault finding and faults remedy in both mechanical and electrical systems • Common faults and weaknesses found in electrical and PLC systems	
	The individual shall be able to: • Wire automation and functions of a project (low voltage) • Produce and initialize PLC programmes for sequence relay control, motion control, process control, distributed control systems and networking • Commission an automation report • Interpret and analyze an automation report and recommend and initialize remedial action required • Remove or repair any electrical faults • Test equipment or plant to ensure that it is operating properly	
	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/)

Your competition appears to relate to the occupation of *Mechanical Engineering Technician*: http://data.europa.eu/esco/occupation/b31e404e-9af6-457d-a58a-208f612eeba3

and/or a limited/junior version of *Mechanical Engineering Technologist*: https://www.onetonline.org/link/summary/17-3029.07

Adjacent occupations can also be explored through these links.