

Technical Description

Web Development

Skill 17



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1 Introduction

1.1 Name and description of the skill competition

1.1.1 The name of the skill competition is

Web Development

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

Web development encompasses many different skills and disciplines in the production and maintenance of websites. The skills required of a web developer are diverse, often to the point it is difficult for a developer to excel in all aspects. As a result, a team may cover the web development process, with each member of the team having their own strengths, specialties, and role in the development process.

Web development involves implementing specific solutions by using web technologies that follow the business rules and objectives outlined by the client. Web developers establish a professional relationship with their clients, interacting with them to develop a deep understanding of the requirements, and convert these into a web application. Creativity and communication skills, coupled with research techniques and a grasp of the target audiences, markets and trends, will ensure final client satisfaction.

Having completed the website content strategies, system architecture planning, user interface design and user experience design, the web developer then integrates the website with third party tools and platforms. During the development process web developers implement the design, use their programming skills in order to create dynamic functionalities, test, and debug the website using a variety of devices.

All these skills may apply equally to the re-design or an upgrade of an existing website.

A web developer has many employment opportunities. These can range from being a self-employed freelancer, or an entrepreneur, to being employed by advertising agencies and web development companies as well as many different other types of organizations. Web developer positions may be broad in scope or specialize in an area such as user interface design, digital user experience design, front-end development, back-end development as well as client and project management. Whichever role a web developer chooses to specialize in, they will need to have access to ICT facilities, open-source libraries, and frameworks.

High performing web developers may have broad or specialist web-related skills. They must understand technical techniques, have solid user interface design skills, programming skills, and take personal responsibility for being constantly at the forefront of trends and web technologies. They must also be responsive to clients and can work in structured and unstructured teams and groups. These qualities enable the web developer to contribute and take advantage of this rapidly developing aspect of modern communications technology.

1.2 The content, relevance and significance of this document

This document incorporates a Role Description and Occupational Standards which follow the principles and some or all of the content of the WorldSkills Occupational Standards. In doing so WSE acknowledges WorldSkills International's (WSI's) copyright. WSE also acknowledges WSI's intellectual property rights regarding 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:

- WSE – Competition Rules
- WSI – WorldSkills Occupational Standard framework
- WSE – WorldSkills Europe Assessment Strategy
- WSE – Online resources as referenced in this document
- WSE – Code of Ethics and Conduct
- Host Country – Health and Safety regulations

2 The Occupational Standards

2.1 General notes regarding WSOS / WSEOS

Where appropriate WSE has utilised some, or all, of the WorldSkills International Occupational Standards (WSOS) for those Skills Competitions that naturally align between the two international competitions. Where the Skill is exclusive to the EuroSkills Competition, WorldSkills Europe has developed its own Occupational Standards (WSEOS) using the same principles and framework to that used for the development of the WSOS. For the purposes of this document the use of the words “Occupational Standards” will refer to both WSOS and WSEOS.

The Occupational Standards 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. Helpfully, for the global consultation on the WSOS in 2014-2021, around 50 percent of responses came from European industry and business.

Each Skill Competition is intended to reflect international best practice as described by the Occupational Standards, and to the extent that it is able to. The Occupational Standards 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 not be separate tests of knowledge and understanding.

The Occupational Standards are 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 Occupational Standards. 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 Occupational Standards. They will reflect the Occupational Standards 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 Occupational Standards to the extent practically possible. A variation of five percent is allowed, provided that this does not distort the weightings assigned by the Occupational Standards.

2.2 Occupational Standards

Section		Relative importance (%)
1	Work organization and self-management	5
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • Principles and practices that enable productive teamwork • The principles and behaviour of web systems and applications • The aspects of systems that contribute to sustainable products, strategies, and practices • How to take initiatives and be enterprising to identify, analyse and evaluate information from a variety of sources 	

Section		Relative importance (%)
	<ul style="list-style-type: none"> • How to identify multiple solutions to a problem and offer them as options against time, budget, and other constraints. • How to use existing available tools and resources to create proper solutions to a problem or requirement • Why proper documentation is necessary and how it is created and maintained 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Create a working schedule considering time limitations and deadlines • Select the most appropriate devices, tools, and software for the actual task • Apply research techniques and skills to keep up to date with the latest industry standards and guidelines • Include images, fonts, and other resources in the correct file format and size when deploying the project • Use GIT version control system • Deploy the web application to a server environment • Connect to server through SSH to operate server-side libraries and frameworks • Adapt a given server configuration accordingly • Utilise collections of codes and software packages which capture frequently used routines to help programmers simplify their work • Create and maintain a proper documentation for your project 	
2	Communication and interpersonal skills	5
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • How to solve communication problems including identifying the problem, research, analysis, solution generating, prototyping, user testing, and outcome evaluation 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Read and understand specifications documents • Deliver a product that responds to client requirements and specification • Gather, analyse, and evaluate information • Interpret standards and requirements • Match client requirements to work needed to produce the right outcome • Present a concept to meet business requirements 	
3	Design Implementation	25

Section		Relative importance (%)
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • The recommendations for making ICT content and applications more accessible to a wider range of people, including standards such as Web Content Accessibility Guidelines (WCAG) • Positioning and layout methods • Design implementation • Usability and interaction design • Cross browser compatibility • Multi device compatibility • Search Engine Optimization (SEO) and performance optimization • How to embed and integrate animations, audio-, and video-files where it is needed 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Create code that conforms and validates to the WCAG standards • Create accessible and usable websites for variety of devices and screen resolutions • Use CSS or other external files to modify the appearance of the website • Use CSS pre/post-processors • Create and update web interfaces for user experience and to assist with search engine performance • Use CSS to develop animations and interactions to the user interface 	
4	Front-End Development	25
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • The JavaScript programming language • How to integrate libraries, frameworks, and other systems or features with JavaScript • Use JavaScript pre/post processors and task running workflow • How to debug front-end (JavaScript, CSS, HTML) errors 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Create website animations and functionalities to assist in context explanations and adding visual appeal • Create and update JavaScript code to enhance a websites functionality, usability, and aesthetics • Manipulate data and custom media with JavaScript • Create modular and reusable JavaScript code • Use of open-source JavaScript libraries and frameworks • Manipulate graphical elements using JavaScript • Use front-end development tools such as the developer tools to debug application issues 	

Section		Relative importance (%)
5	Back-End Development	40
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • Object-oriented PHP as the backend development technology • Open-Source server side libraries and frameworks • How to design and implement databases using MySQL • How to manage data exchange (consume and provide) between server and client systems (REST API) • Software design patterns, e.g. Model View Controller Pattern (MVC) • Web application security according to OWASP guidelines • How to create and use application testing with unit testing • How to debug backend PHP errors in the application • How to utilize modern debugging tools such as xDebug, GreyLog, or smiliar; • How to debug server misconfiguration such as wrong file permissions, database connections, etc. • How to debug complicated SQL errors 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Manipulate data making use of programming skills • Create REST API endpoints according to the requirements or the provided specification • Protect against security exploits • Integrate with existing code with Application Programming Interfaces (APIs), libraries, and frameworks • Create or maintain a database to support the system requirements • Create code that is modular and reusable • Detect if an error is caused by logical issue in the code implementation or if it is a server misconfiguration • Enable error reporting in the chosen programming language 	
	Total	100

3 The assessment approach & principles

3.1 General guidance

Note: this Section and Section 4 summarize a great deal of new information and guidance regarding assessment. Please refer to the Competition Rules for greater detail.

The Competition Committee (CC) establishes the principles and techniques to which assessment at the EuroSkills Competition must conform.

Expert assessment practice lies at the heart of the EuroSkills 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 EuroSkills Competition: the Marking Scheme, Test Project, and Competition Information System (CIS).

Assessment at the EuroSkills Competition falls into two broad types: measurement and judgement. All assessments will be governed by explicit benchmarks, referenced to best practice in industry and business.

The Marking Scheme must include these benchmarks and follow the weightings within the Occupational Standards. The Test Project is the assessment vehicle for the Skill Competition, and also follows the Occupational Standards. The CIS enables the timely and accurate recording of marks, and has expanding supportive capacity.

The Marking Scheme, in outline, will lead the process of Test Project design. After this, the Marking Scheme and Test Project will be designed and developed through an iterative process, to ensure that both together optimize their relationship with the Technical Description and the principles for assessment as set out in the WSE Assessment Strategy. They will be agreed by the Experts and submitted to WSE for approval together, in order to demonstrate their quality and conformity with the Occupational Standards.

Prior to submission for approval to WSE, the Marking Scheme and Test Project will be reviewed by the WSE Skill Advisors in order to benefit from the capabilities of the CIS.

4 The Marking Scheme

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 Assessment overview

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

For transparency reasons and optimizing the marking process, automated testing has been introduced. By using this way of marking it is ensured that all competitors are treated equally. Test cases need for the automated tests are also developed by the external test project developers. There are tests for the backend and if possible also test cases for the frontend. The results from the automated test will be randomly double-checked by the experts.

The marking teams will be grouped by the SMT. The process looks like the following: One of the experts is operating the workstation and interacting with the competitors' work. All four experts are assessing and discussing the work, if needed. One of the experts is entering the marks into CIS under the supervision of the other three experts.

4.10 Skill Assessment Procedures - Mark distribution

This section defines the assessment criteria and the number of marks (judgement and measurement) awarded. The total number of marks for all assessment criteria must be 100. The table below is advisory only for the development of the Test Project and Marking Scheme.

Section	Criterion	Marks		
Task		Judgement	Measurement	Total
A	Dynamic Website with server-side rendering	9	23	32
B	Commercial Open API	5	29	34
C	Interactive Frontend using an API	11	23	34
Total =		25	75	100

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 skills in each section of the Occupational Standards.

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

The Test Project will not cover areas outside the Occupational Standards, or affect the balance of marks within the Occupational Standards other than in the circumstances indicated by Section 2.1.

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 the EuroSkills Competition's rules and regulations.

This Technical Description will note any issues that affect the Test Project's capacity to support the full range of assessment relative to the Standard Specification. Section 2.1 refers.

5.2 Format/ structure of the Test Project

- Test Project with separately assessed modules

5.3 Test Project design requirements

Here is a list of the TP requirements:

- Selfconfined half-day modules
- automated Testcases for the front-end and/or back-end
- Speed-Test module
- a Team challenge

5.4 Test Project development

The Test Project **MUST** be submitted using the templates provided by WSE. Use the Word template for text documents and DWG template for drawings. Please contact jordy.degroot@worldskillseurope.org for guidance.

If the Test Project is designed by an Independent Test Project designer, then the Test Project must be designed in accordance with the WSE Independent Test Project Guide v1.1.

If your Skill wishes to have an Independent Test Project designer, you must ensure that WorldSkills Europe is made aware of this, so that it can be assured that there is proper funding in place, or that the Independent Test Project designer is aware that he/she will do this task free of charge.

5.4.1 Who develops the Test Projects or modules

The Test Project / modules are developed under the supervision of:

There are two possible scenarios:

- Scenario A: An Independent Test Project Designer
- Scenario B: The Test Project is created on the forum by Experts nominated by the SMT

5.4.2 How and where is the Test Projects or modules developed

The Test Project or modules are developed in the following manner:

- Other:
 - Scenario A: The Independent Test Project Designers create the Test Project according to the WSE ITPD Procedures.
 - Scenario B: The Test Project is created by the nominated Experts and volunteers on the Discussion Forum

5.4.3 When is the Test Project developed

The Test Project is developed according to the following timeline:

TIME	ACTIVITY
12 months prior to the Competition	<p>Scenario A: CE will contact external developers/WorldSkills experts to initiate the process of creating the test project. A list of potential ITPDs will be sent to Director of Competitions & Operations and the Competition Coordinator by the CE.</p> <p>Scenario B: No activities have started yet.</p>
10 months prior to the Competition	<p>Scenario A: The Director of Competitions & Operations, on behalf of the Competitions Committee Management Team, makes an Agreement with the Independent Test Project Designer(s).</p> <p>Scenario B: No activities have started yet.</p>
9 months prior to the Competition	<p>Scenario A: CE organizes a meeting between CE, DCE, SA and ITPD to discuss the TD & IL in detail and the guidelines for the Test Project and the Marking Scheme. The ITPDs start to develop the Test Project.</p> <p>Scenario B: The Test Project development will be initiated on the forum by CE.</p>
4 months prior to the Competition	<p>Scenario A: The ITPD complete the creation of the Test Project and provide evidence, that the Test Project was validated by partners from the industry.</p> <p>Scenario B: The nominated lead experts circulate the first version of the TP to all experts on the EuroSkills forum to gather feedback.</p>
3 months prior to the Competition	<p>Scenario A: No change</p> <p>Scenario B: A final version of the TP will be circulated on the EuroSkills forum by the nominated lead experts.</p>

At the Competition	<p>Scenario A: On C-3 or C-2 the ITPDs present their Test Project to all experts.</p> <p>Scenario B: If the TP was developed by all experts, the module lead experts present their groups module to all other experts.</p>
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5.5 Test Project validation

Scenario A: According to the WSE ITPD Procedures, a proof of validation is provided by the ITPD.

Scenario B: The final Test Project modules will be validated by the nominated experts prior to the Competition. The Chief Expert and Deputy Chief Expert will aid the nominated experts in the validation of each module. It needs to be ensured that:

- The project can be completed in the specified time
- The project can be completed with the provided material/media files
- The marking schemes are appropriately developed, and all aspects marked are clearly identifiable in the written Test Project instructions

5.6 Test Project selection

- Other:
 - Scenario A: The Test Project is developed by an Independent Test Project Designer and therefore no selection is necessary.
 - Scenario B: The Test Project is developed by nominated Experts and therefore a vote on the Discussion Forum is performed.

5.7 Test Project circulation

Please note that if a Test Project is known by the Chief- and/or Deputy Chief Experts, and/or any of the other Experts, it must be shared via the forums before the start of the Competition. This also means that this Test Project is subject to a 30% change before the start of the Competition.

The Test Project is circulated via the website as follows:

- Other:
 - Scenario A: According to the WSE ITPD Procedures nothing is shared.
 - Scenario B: The Test Project is published 3 months prior to the competition.

5.8 Test Project coordination (preparation for competition)

Coordination of the Test Project will be undertaken by:

- Chief Expert and Deputy Chief Expert

5.9 Test Project change at the competition

Scenario A: Not applicable

Scenario B: Every expert comes up with a change proposal and then all Experts vote and agree on a 30% change to the Test Projects

5.10 Material or manufacturer specifications

Specific material and/or manufacturer specifications required to allow the Competitors to complete the Test Project will be supplied by the Host Organization and are available via the forums. 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.

Not applicable.

5.11 Software specifications

Not applicable.

6 Skill management and communication

6.1 Discussion forum

Prior to the EuroSkills Competition, all discussion, communication, collaboration, and decision making regarding the Skill Competition must take place on the skill specific Discussion Forum, which can be reached via www.worldskillseurope.org. Skill related decisions and communication are only valid if they take place on the forum. The Chief Expert (or an Expert nominated by the Chief Expert) will be the moderator for this Forum. Refer to Competition Rules for the timeline of communication and competition development requirements.

6.2 Competitor information

All information for registered Competitors is available from the WorldSkills Europe website www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

The information includes:

- Competition Rules
- Technical Descriptions
- Test Projects
- Infrastructure List
- EuroSkills Health, Safety, and Environment Policy and Regulations
- Other Competition-related information

6.3 Test Projects and Marking Schemes

Circulated Test Projects will be available at the WorldSkills Europe website from www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

6.4 Day-To-Day management

The day-to-day management of the Skill Competition during the EuroSkills Competition is defined in the Skill Management Plan that is created by the Skill Management Team led by the Chief Expert. The Skill Management Team comprises the Jury President, Chief Expert and Deputy Chief Expert. The Skill Management Plan is progressively developed in the six months prior to the Competition and finalized at the Competition by agreement of the Experts. The Skill Management Plan can be viewed at www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

7 Skill specific safety requirements

7.1 Requirements

Refer to Host Country/Region Health and Safety documentation for Host Country/Region regulations. This document will be shared via the forums. One overall Health and Safety document will be published, as well as Skill specific safety requirements.

8 Materials and equipment

8.1 Infrastructure List

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

The Infrastructure Lists will be available at the WorldSkills Europe website from www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

The Infrastructure List specifies the items and quantities requested by the Experts for the next Competition. The Host Organization will progressively update the Infrastructure List specifying the actual quantity, type, brand, and model of the items.

At each Competition, the Experts must advise the Competition Manager 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.

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 Competitor tools

WorldSkills Europe aims to minimize the sending of toolboxes as much as possible. We therefore ask you to keep this in mind when writing the section below. Please be advised that competitors should bring as little as possible and what they do bring **MUST** be true hand tools. Only items are allowed that would significantly affect their ability to perform the task and deliver the Test Project to a high standard.

There is no competitor toolbox.

8.3 Materials, equipment and tools supplied by Competitors in their toolbox

Competitors may bring the following items:

- Mouse with mousepad
- A maximum of one USB keyboard in the Competitors desired language. Note: If the keyboard brought by the Competitor does not work then a standard keyboard will be provided by the Competition Organizer
- Language file for Microsoft OS or Ubuntu Linux to make the keyboard work correctly
- Headset and extension cable

Any device brought in by the Competitor may not have any internal memory storage or wireless connection. Assigned Experts and Workshop Manager have the right to disallow certain equipment brought by Competitors.

Backup equipment is allowed in case of failure but should always be kept inside the Competitors locker.

8.4 Materials, equipment and tools supplied by the Experts

An Expert can upload music for their Competitor to a system 1 month prior to the competition. A maximum of 250MB per competitor is allowed. All music files will be verified by assigned experts then shared on a dedicated system accessible by all competitors.

8.5 Materials, equipment and tools prohibited in the Skill area

The Skill area is the area outside the experts room within the Workshop Area.

- Extra software
- Mobile phones
- Tablet devices
- Smart watches
- Photography/Video devices
- USB Drives
- Any device brought into the workshop may not have any internal memory storage devices

The Chief Expert, Deputy Chief Expert and Workshop Manager have the right to disallow equipment brought by Competitors

8.6 Workshop Layout

Workshop layouts from previous competitions are available by contacting the Competition and IT Coordinator at: jordy.degroot@worldskillseurope.org. New Workshop Layouts will be communicated via the forums when completed.

Please be advised that you will have the opportunity to discuss your Workshop Layout proposal with the Host Organization during the Skills Development Workshop (SDW) and the Competition Preparation Meetings (CPM).

For workshop layout development, please refer to the forums.

9 Skill-specific rules

9.1 Introduction

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 Personal laptops – USB – memory sticks – mobile phones

Chief Expert, Deputy Chief Expert, and Experts are allowed to bring personal laptops, USB/memory sticks, and mobile phones into the Expert meeting room. All devices are allowed to be taken outside of the meeting room at the end of each day.

Competitors are not allowed to bring personal laptops, tablets, USB/memory sticks, mobile phones, smart watches and other similar devices into the workshop. If Competitors do bring them into the workshop, they need to lock them in their locker. They can be retrieved at lunchtime or at the end of each day.

9.3 Personal photo cameras – video taking devices

Chief Expert, Deputy Chief Expert, and Experts are allowed to bring cameras into the Expert meeting room. Cameras are allowed to be taken outside of the meeting room at the end of each day.

- No cameras are allowed in the workshop until the completion of competition on C3.
- Note that cameras, laptops, or any other electronic devices may be allowed on the afternoon of C3 with approval from the SMT because there usually is a Test Project that tests communication and organization skills, where Competitors team up into groups.

9.4 Communication between compatriot experts and competitors

According to the official Competition Rules

9.5 Other

Common Internet workstations can be used to look up information. During the time on the Internet workstation, Competitors are only allowed to surf the web. Competitors are not allowed to chat or communicate with others. Assigned Experts will supervise the Internet workstation when it is in used by a Competitor. Any notes must be written on the assigned space in the official Test Project module description. Notes may be taken between the Competitors workstation and the Internet workstation.

Competitors will not have access to the Internet from the Competitor workstations.

10 Visitor and media engagement

10.1 Engagement

Following is a list of possible ways to maximize visitor and media engagement, within the remit of the Competition Rules:

- If possible two mirrored monitors displayed for the public to view the competitors' screens
- Display screens and a laptop showing a PowerPoint presentation on what competitors are currently working on.
- Enhanced understanding of Competitor activity
- Career opportunities
- People's Choice awards
- Display screens showing the results of on-going speed challenges
- "Spot the difference" Challenge for the audience

11 Sustainability

11.1 Sustainability

This Skill Competition will focus on the sustainable practices below:

- Recycling – No printing for Competitor workstations
- Use of completed Test Projects after Competition
- Limit the amount of software to be installed on Competitor workstations
- Open-Source software
- No marking sheets, experts mark by computer straight into the CIS
- No toolboxes except what the competitors bring in their own luggage
- Green Coding, meaning to code in a way to use as little power as possible
- Reduce digital footprint by removing unused backups