# MANUFACTURING AND ENGINEERING TECHNOLOGY Industrial Design Technology

# **WorldSkills Occupational Standards**



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## WorldSkills Occupational Standards (WSOS)

### **Occupation description and WSOS**

#### The name of the occupation is

Industrial Design Technology

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

Industrial design technology is the creation of a product designed for mass consumption. It must succeed in both form (appearance) and function, and promote efficient manufacture. It must be technically feasible to produce, and meet a genuine need in the marketplace, at an acceptable price.

To fulfil the role of an industrial design technician, knowledge, skills, and qualities are required in each of the following broad areas:

- market research, graphic and wider communication skills
- design and development processes
- engineering practice, product analysis, and materials science/engineering

In modern, successful economies, industrial design follows a thinking process, which can be summarized as follows:

- Inspiration: understand; observe; perspective/orientation
- ideation: develop ideas; prototype; test
- implementation: "story telling" (create value proposition); pilot; create the business model.

In start-ups and small companies, industrial design technicians may themselves cover all steps in this process. In larger organizations, they may support and contribute to either each phase of the process, or one or two phases only. For industrial design in larger organizations, teamwork is advantageous, to capitalize on a range of perspectives, attitudes, knowledge and skills.

Industrial design technology combines two disciplines: design, and engineering, in order to innovate, with success as measured by the customer's response and the producer's viability and profit. It is essentially disruptive to current ways of doing and making things. This means that the industrial designer must stay constantly alert to new materials, technologies, markets, and consumer demand and benefit.

In summary: the sequence of steps, starting with market research, ideas development, and design, before physically making and testing, often many times, distinguishes industrial design from craft-based design. This is a very important difference to the process of the craft-based designer, whose creativity is embedded in the act of making. Good industrial design technicians respect the importance of inspiration and ideation as a separate set of activities, before testing, improvement and manufacture.



#### **General notes on the WSOS**

The WSOS 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/WSOS).

The skill competition is intended to reflect international best practice as described by the WSOS, and to the extent that it is able to. 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 that are set out in the Standards Specification. 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, provided that this does not distort the weightings assigned by the Standards.



### WorldSkills Occupational Standards

Section		Relative importance (%)
1	Work organization and management	5
	<ul> <li>The individual needs to know and understand:</li> <li>The role and responsibilities of the industrial design technician, and how it differs from craft-based design, creativity, and production</li> <li>Principles and practices for safe working practice across different work settings</li> <li>Principles and methods for</li> <li>organizing own time efficiently and effectively</li> <li>setting and reaching goals for self and own areas of responsibility</li> <li>scheduling and organizing work assignments</li> <li>establishing priorities and rescheduling</li> <li>Good practice in generating and maintaining records</li> <li>Ethical principles for safeguarding and maintaining clients' and organizations' security and proper business advantage</li> <li>The norms and expectations for best practice in one's role.</li> </ul>	
	<ul> <li>The individual shall be able to:</li> <li>Apply safe working methods personally and for others</li> <li>Select and keep to efficient and effective work methods and habits</li> <li>Estimate time requirements for each phase of the design process, and create timelines</li> <li>Select and use appropriate planning and management tools</li> <li>Maintain orderly and secure work areas</li> <li>Maintain work records as required and helpful</li> <li>Minimize distractions that impact on own effectiveness and efficiency</li> <li>Respond positively to formal and informal opportunities to learn and update knowledge and expertise.</li> </ul>	



Section		Relative importance (%)
2	Market research and ideas formation	15
	<ul> <li>The individual needs to know and understand:</li> <li>Their organization's <ul> <li>brand</li> <li>position in the market</li> <li>range and nature of products and services</li> <li>business strategies and plans</li> </ul> </li> <li>The sources of design commissions and requirements</li> <li>Principles and methods for researching <ul> <li>Customer satisfaction</li> <li>Market opportunities</li> </ul> </li> </ul>	
	<ul> <li>Principles, methods and ethics for obtaining information by</li> <li>Observation</li> <li>Feedback</li> <li>Surveys</li> <li>Analysis</li> <li>Secondary (indirect) sources</li> </ul>	
	<ul> <li>Principles and techniques for drawing conclusions from data and inputs:</li> <li>Inductive reasoning (combining information in order to generalize)</li> <li>Deductive reasoning (applying general rules to situations).</li> </ul>	

The individual shall be able to

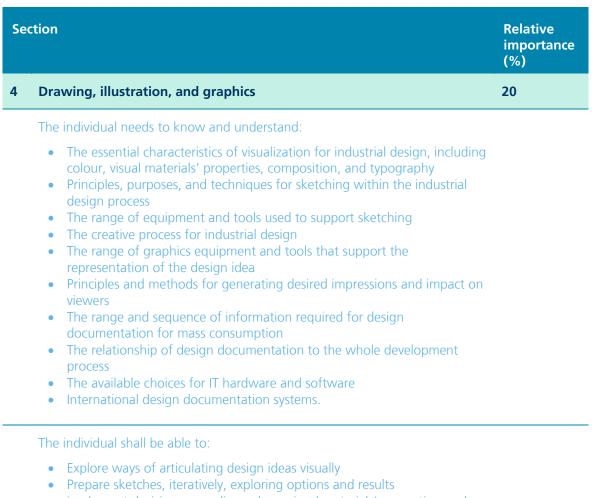
- Receive and mentally process information and requests
- Participate in new market research and product planning
- Review the relationship of potential new products to the organization's product range and plans
- Review and select alternative methods for obtaining market intelligence
- Investigate the potential need and benefit of new products and product lines using suitable research methods
- Draw conclusions from the market research
- Maintain records of the market research and thinking process.





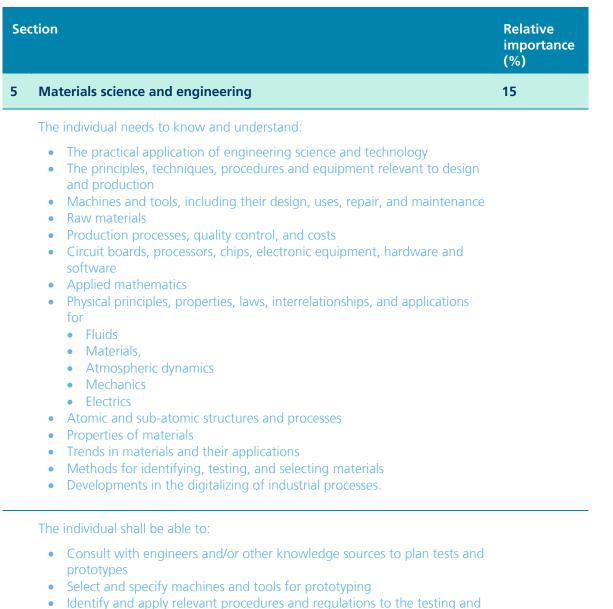
- Conceive or receive a design idea
- Through market research and consultation, create, realize, and evaluate design concepts for manufacturing
  - Evaluate the feasibility of design ideas, relative to
    - Appearance
    - Safety
    - Function,
    - Serviceability
    - Budget
    - Production methods and costs
    - Market characteristics
  - Modify and refine design ideas, based on the above factors
  - Complete the design process within the parameters of the business or commission.





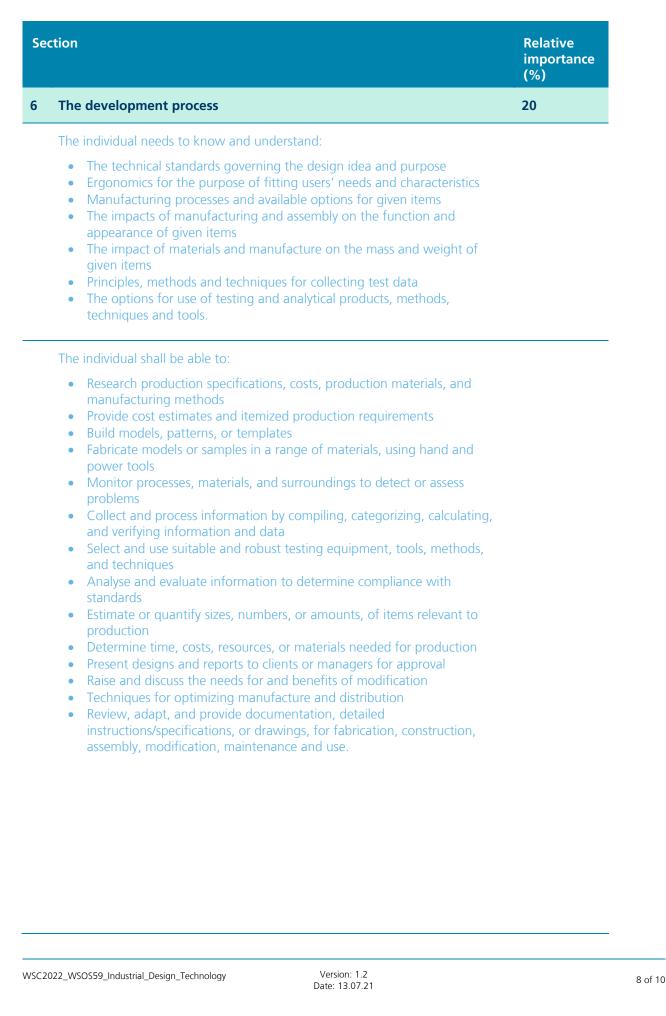
- implement decisions regarding colour, visual materials' properties, and composition
- Create
  - detailed drawings
  - illustrations
  - artwork or blueprints
- use drafting instruments and tools
- use CAD software
- draft, lay out, and specify technical devices, plants and equipment
- update sketches, drawings, and documentation as development proceeds
- maintain document control throughout the design process.



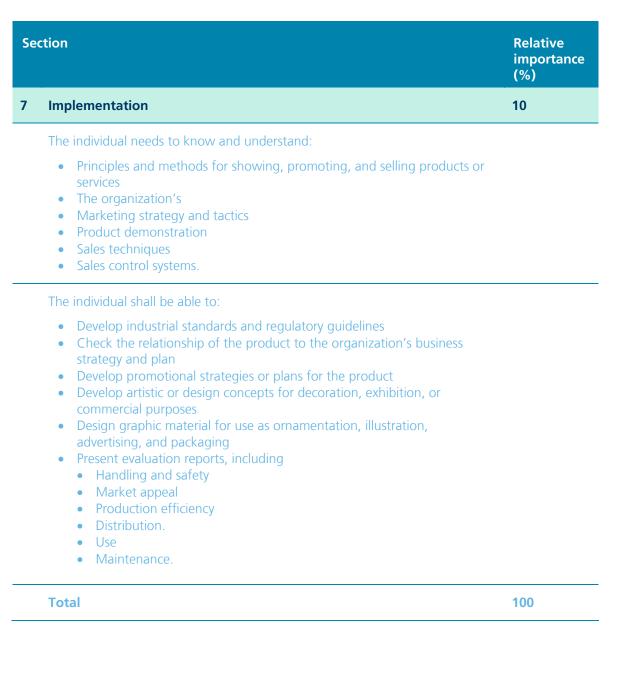


- Identify and apply relevant procedures and regulations to the testing a prototyping process
- Determine the purposes, range and scope of tests and prototypes
- Put in place measures to ensure the validity of information and data collected
- Conduct tests and prototyping
- Collect planned information and data for analysis
- Review the implications of the analysis for
  - The manufacturing process, and outcomes, and
  - the selection and use of materials.











## **References for industry consultation**

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 (<u>www.onetonline.org/</u>)

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 2022.

There were no responses to the requests for feedback this cycle