SAEINDIA SOUTHERN SECTION

KRT COMPETITION

CAD (Computer Aided Design)

SAEINDIA Southern Section (SAEISS), by a resolution of the Technical Committee and in agreement with the Constitution, the Standing Orders and the Competition Rules, has embraced the following minimum requirements for this skill for the Regional level Competition for the professional members.

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

Computer Aided Design – CAD

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

Computer aided design is the use of computer systems to assist in the creation, modification, analysis or optimization of an engineering design. CAD software is used to enhance the productivity of the designer, improve the quality of design, improve communication through documentation and create a database for manufacturing. CAD output is often in the form of electronic files for print, manufacturing or other manufacturing processes.

The technical and engineering drawings and images must convey information such as materials, processes, dimensions and tolerances according to application-specific conventions. CAD is also used to produce computer animation for the special effects used in, for example, advertising and technical manuals.

CAD is an important industrial art and is the way projects come true. The CAD process and outputs are essential to successful solutions for engineering and manufacturing problems.

CAD software helps us explore ideas, visualize concepts through photorealistic renderings and movies and simulates how the design project will perform in the real world.

1.2 THE RELEVANCE AND SIGNIFICANCE OF THIS DOCUMENT

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

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

2) THE SAEISS STANDARDS SPECIFICATION (SAEISSSS)

2.1 GENERAL NOTES ON THE SAEISS

In this competition the assessment of knowledge, specific skill and understanding will take place through the assessment of performance.

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.

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

2.2 GENERAL NOTES ON THE SAEISS

SECTION		RELATIVE IMPORTANCE (%)
1	**Work organization and management**	**20**
	The individual needs to know and understand: • The various purposes and uses for CAD designs • Current internationally recognized standards (ISO) • Standards currently used and recognized by industry • Technical terminology and symbols • The importance of accurate and clear presentation of designs to potential users • The importance of effective communications and inter-personal skills between co-workers, clients and other related professionals • The importance of maintaining knowledge and skill in new and developing technologies • The role of providing innovative and creative solutions to technical and design problems and challenges	
	The individual shall be able to: • Apply consistently the internationally recognized standards (ISO) and standards currently used and recognized by industry. • Use and interpret technical terminology and symbols used in preparing and presenting CAD drawings. • Use systems and related professional design software to consistently produce high quality designs and interpretations. • Produce work that consistently meets high standards of accuracy and clarity in the design and presentation of designs to potential users. • Demonstrate effective communications and inter-personal skills between co-workers, and also to ensure that the CAD process meets requirements. • Explain complex technical images to experts and non-experts, highlighting key elements. • Provide and apply innovative and creative solutions to technical and design problems and challenges.	
2	**3D Modeling**	**20**
	The individual needs to know and understand: • Programs in order to be able to configure the parameters of the software • Computer operating systems in order to use and manage computer files and software • Mechanical systems and their functionality • Principles of technical drawing	

	The individual shall be able to: • Model components, optimizing the constructive solid geometry • Create sub-assemblies of components • Ascribe characteristics to the materials (density) • Ascribe colors and textures to the components • Produce assemblies from 3D models of components • Estimate approximate values for any missing dimensions • Assemble modeled parts into sub-assemblies as required • Apply graphics decals such as logos as required onto images	
3	**Create Photo Rendered Images (2D)**	**20**
	The individual needs to know and understand: • The use of lighting, scenes and decals to produce photo rendered images.	
	The individual shall be able to: • Save and label images to access for further use • Apply material properties using information supplied from source drawings • Create photo rendered images of components or assemblies • Adjust colors, shading, backgrounds and camera angles to highlight key images • Print completed images for presentation purposes	
4	**Technical Drawing and Measuring**	**20**
	The individual needs to know and understand: Working drawings in ISO standard together with any written instruction. Standards for conventional dimensioning and tolerancing and geometric dimensioning and tolerancing appropriate to the ISO standard. Rules of technical drawing and the prevailing latest ISO standard to govern these rules	
	The individual shall be able to: • Generate working drawings in ISO standard together with any written instructions. • Apply standards for conventional dimensioning and tolerancing and geometric dimensioning and tolerancing appropriate to the ISO standard. • Use manual, tables, lists of standards and product catalogues. • Insert written information such as explanation balloons and parts lists with more than one column using annotation styles that meet ISO standards. • Create 2D detail technical drawings. • Create exploded isometric views. • Create Bill of Materials.	
5	**Presentation**	**20**
	• Briefing of the project detail to the jury.	

3) THE MARKING SCHEME

3.1 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 SAEISS Competition, in that it ties assessment to the standards that represent the skill. It is designed to allocate marks for each assessed aspect of performance in accordance with the weightings in the Standards Specification.

4) THE TEST PROJECT

4.1 GENERAL NOTES

The Test Project will enable the assessment of the skills in each section of the SAEISSSS.
The purpose of the Test Project is to provide full and balanced opportunities for assessment and marking across the Standards Specification, in conjunction with the Marking Scheme. The relationship between the Test Project, Marking Scheme and Standards Specification will be a key indicator of quality.
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 SAEISS rules and regulations.

4.2 TEST PROJECT DESIGN REQUIREMENTS

The Competition covers the following categories:
ONE DAY - Mechanical assemblies and detail drawing for manufacturing:
Data (Input):
• Finished drawings of components or assemblies
• Nomenclature

Work requested:
• To produce models of components from detail drawings;
• To produce an assembly;
• To produce detail drawing(s) for manufacture;
• Part and Assembly drawing(s);
• Presentation of the work;
• Bill of Materials;
• Isometric & Exploded view(s).