Inter College Skills Competition – 2025/26

Competition: Mechanical Engineering – Producing a Metric Drill Gauge

Competitors: Up to 2 competitors per college

Duration: 4 hours approx.

Overview: For this hands-on competition, Engineering competitors will be required to put their practical workshop skills to test using a range of traditional hand tools – marking out tools, cutting tools, measuring tools and equipment – and bench fitting techniques to produce an engineering component to given specifications.

This competition is about showcasing craftsmanship, attention to detail, and mastery of core engineering skills. So whether you're a perfectionist with a file or a strategist with a scriber, this competition will be sure to bring out the best engineer in you.

Scenario: You are an engineering fitter apprentice working at a company that manufactures high-quality, custom-made tools, parts, and components for various engineering industries.

A client that carries out mechanical maintenance activities in industrial plants has requested a custom-designed metric drill gauge that is compact and fits their need for the most frequent drill bit and screw size checks they perform.

Your supervisor has produced an engineering drawing of the metric drill gauge (see next page) based on the client's requirements, and has tasked you to use this engineering drawing to produce this component to the given specifications.

Materials, Tools & Equipment:

Material: Bright Drawn Mild Steel (BDMS) [150 mm × 76 mm × 6 mm]

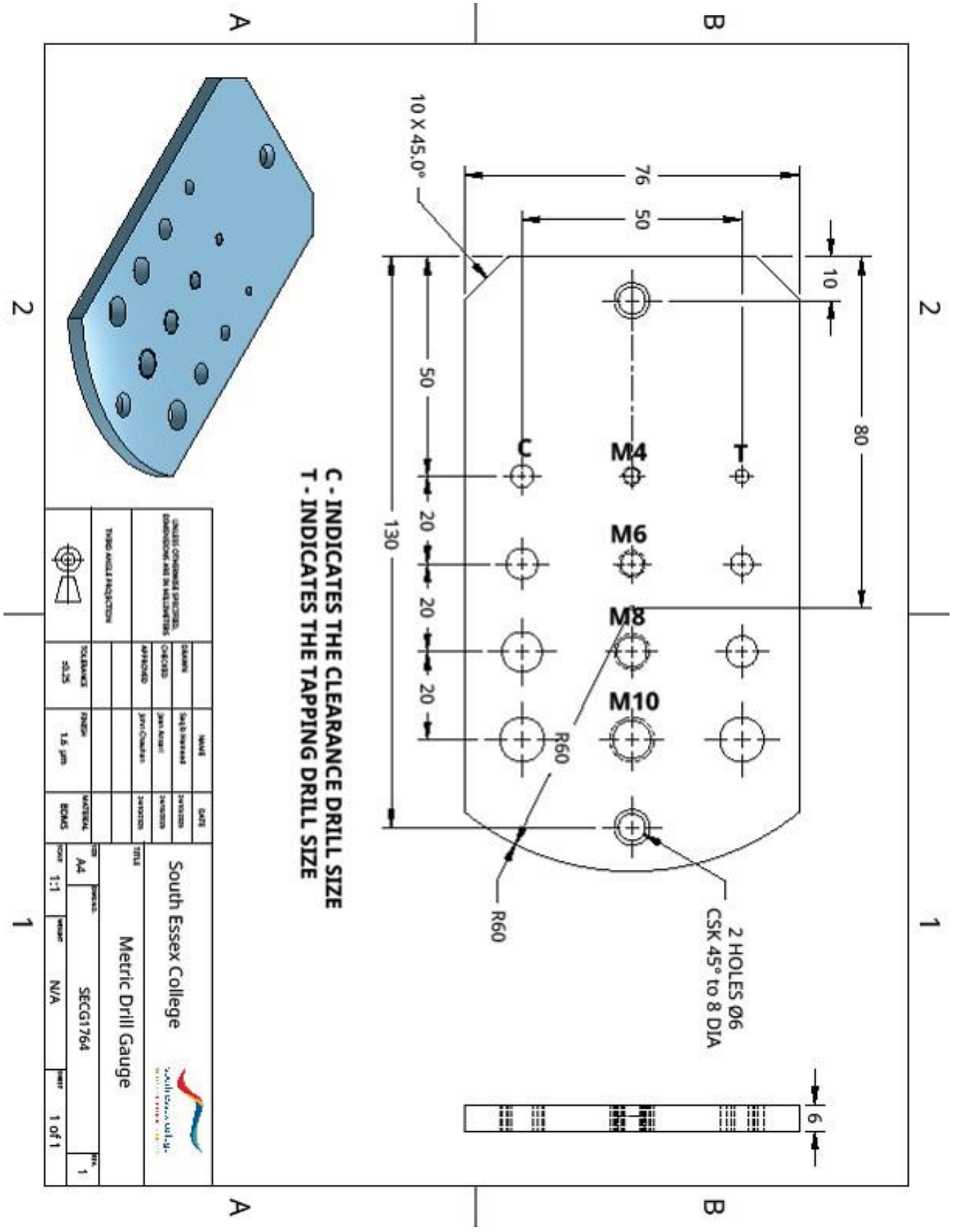
Cutting Tools: Hacksaw; Files (rough, medium, smooth); Emery Cloth; Tap Sets (M4, M6, M8, M10) and Tap Wrench

Marking Out Tools: Engineering Blue; Scriber; Engineering Protractor; Spring Divider; Vernier Height Gauge; Centre Punch; Hammer

Measurement Tools: Digital Calliper, Engineering Square, Engineering Ruler

Equipment: Pillar Drill Machine; Standard Twist Drill Bits (various diameters); countersink drill bit (45°); Cutting Compound (Treflox),

All materials, tools, and equipment will be provided at the competition.


10 X 45.0°
76
50
10
80
50
20
20
20
130
C
T
M4
M6
M8
M10
R60
R60
2 HOLES Ø6
CSK 45° to 8 DIA
6
C - INDICATES THE CLEARANCE DRILL SIZE
T - INDICATES THE TAPPING DRILL SIZE
South Essex College
Metric Drill Gauge
SEGG1764
A4
1:1
N/A
1 of 1
1
±0.25
1.6 µm
BSMS

Competition Assessment

Competitors will be assessed using <u>two</u> complementary **judging tools**:

1 Quality Inspection Sheet

Possible marks: **50**

This sheet evaluates the technical accuracy and finish of the completed metric drill gauge, including dimensions, hole quality, surface finish, and overall compliance with the engineering drawing.

2 Competency and Behaviour Rubric Sheet

Possible marks: **15**

This sheet assesses core engineering competencies and behaviours essential for this job, including:

- Health and safety
- Planning and preparation
- Time management
- Independent working skills
- Interpretating engineering drawings

Total Together, these judging tools provide a balanced and fair assessment of both the quality of the final product and the process used to achieve it, ensuring that competitors are recognised for their practical ability, technical understanding, and professional conduct.

Total Possible marks: **65**

Final Competitor Score Card		
Competitor Name:		
Judging Tool	**Marks**	
Tool 1: Quality Inspection Sheet		/50
Tool 2: Competency and Behaviour Rubric Sheet		/15
Total Marks:		**/65**

Tool 1: Quality Inspection Sheet					
Competitor Name:					
Component feature	**Recorded measurement/assessment**			**Meets specification? (Marks)**	
Maximum length					/1
Overall width					/1
Angle of Chamfered Corners	C-Edge				/1
	T-Edge				/1
R60 Bottom Arc					/1
Position of Clearance Holes	M4				/2
	M6				/2
	M8				/2
	M10				/2
Position of Tapping Holes	M4				/2
	M6				/2
	M8				/2
	M10				/2
Position of Tapped Holes	M4				/2
	M6				/2
	M8				/2
	M10				/2

Diameter of Clearance Holes	M4			/1
	M6			/1
	M8			/1
	M10			/1
Diameter of Tapping Holes	M4			/1
	M6			/1
	M8			/1
	M10			/1
Tapped Holes Screw Fit and Alignment Check	M4			/1
	M6			/1
	M8			/1
	M10			/1
Position of Countersink Holes	Top			/2
	Bottom			/2
Outer Diameter of Countersink Holes	Top			/1
	Bottom			/1
Surface Finish (Front)				/1
Surface Finish (Back)				/1
Burr-free holes and edges				/1
		Total Marks		**/50**

Tool 2: Competency and Behaviour Rubric Sheet					
Competitor Name:					
Assessment Theme	**3 marks**	**2 marks**	**1 mark**	**0 marks**	**Marks**
Health and safety	Wore all required PPE throughout the task, such as safety glasses, gloves, and steel-toe boots; workspace was clean and hazard-free with tools and equipment used correctly without any unsafe practices.	Wore all PPE except one item (e.g., gloves or safety glasses); workspace had one minor hazard that did not impede safety; tools and equipment used correctly with one isolated unsafe practice.	Missed multiple PPE items; workspace had two minor hazards; tools and equipment used incorrectly on more than two occasions, leading to unsafe practices.	No PPE worn during the task; workspace was unsafe with multiple hazards; tools and equipment used incorrectly throughout, leading to significant safety risks.	
Planning and preparation	Collected all required tools and equipment before starting the task; checked all tools and materials for defects; obtained and followed technical documentation without error.	Collected most required tools and equipment (missing no more than one item); checked some tools and materials for defects; obtained technical documentation but made one interpretation error.	Collected only half of the required tools and equipment; checked tools and materials inconsistently; obtained technical documentation but made multiple interpretation errors.	Failed to collect required tools and equipment; performed no checks on tools and materials; did not obtain or follow technical documentation correctly.	
Time management	All tasks completed within the allocated time; steady progress maintained throughout with no delays or interruptions.	All tasks completed within the allocated time; one minor delay occurred but progress was generally steady.	Some tasks completed within the allocated time but required an extension; frequent delays interrupted steady progress.	Failed to complete the task within the allocated or extended time; progress was consistently slow with significant interruptions.	
Independent working skills	Worked independently throughout the task; made accurate and effective decisions; demonstrated initiative and confidence consistently.	Worked independently for most parts of the task; made generally accurate decisions; demonstrated initiative in a few areas but required occasional guidance.	Worked independently for some parts of the task; made some correct decisions but relied on frequent guidance; limited initiative shown.	Unable to work independently; relied entirely on guidance; showed no initiative or confidence throughout.	
Interpreting engineering drawings	Interpreted all dimensions, tolerances, and symbols exactly as	Interpreted most dimensions, tolerances, and symbols correctly	Interpreted some dimensions, tolerances, and symbols correctly	Misinterpreted or missed critical dimensions, tolerances, and	

	specified; followed the engineering drawing without error or need for assistance.	(missed no more than one feature); followed the engineering drawing with occasional guidance.	(missed more than two features); relied heavily on guidance to follow the engineering drawing.	symbols; unable to follow the engineering drawing correctly even with guidance.	