Higher Graphic Communication

Course Assessment Information (From 2018)

The changes to the Higher Graphic Communication Course is shown below.

Component	Marks	Duration
1: Question Paper	90	2 hours and 30 minutes
2: Assignment	50	8 hours

Question Paper (90/140 marks)

This is 64% of your overall marks. It gives the opportunity to demonstrate skills, knowledge and understanding relating to the following:

Area	Range of marks
Computer-aided design techniques	20–30
Interpretation of graphic items	12–30
Digital technology in graphic communication	4–12
Drawing standards, protocols and conventions	7–14
Desktop-publishing features, design elements and principles	20–30

Assignment (50/140 marks)

This is 34% of your overall marks.The assignment assesses candidates' ability to apply graphic communication skills and knowledge aquired and developed during the course, in the context of defined tasks which require a response to a problem or situation. It will cover the 3P's:

Area	Range of marks
Preliminary graphics	5–15
Production graphics	10–25
Promotional graphics	10–25

EXAM

28th May 2020

9:00- 11:30

Question paper (knowledge and understanding)		Assignment (skills)	
Graphic types	The role of preliminary, production and promotional graphics in the design, manufacturing and marketing of a product or publication.	**Graphic types**	Producing effective preliminary, production and promotional graphics.
Manual techniques	Manual graphic communication techniques and processes, and their relative merits compared to electronic methods. A range of common manual graphics media.	**Manual techniques and/or computer-aided techniques**	Selecting and applying manual and/or computer-aided and desktop-publishing (DTP) graphic techniques and processes. Using graphic communication applications and a range of common graphic media, equipment and/or devices to produce effective and informative graphic communications.
Computer-aided techniques	Computer-aided techniques, computer-aided design (CAD), desktop publishing (DTP), digital capture/input and output techniques and devices.		
Drawing standards, protocols and conventions	Recognised drawing standards, protocols and conventions, demonstrated through application, identification and recognition in given contexts, views and items. ♦ line types: — dimension lines, centre line, hidden detail, cutting planes, fold lines ♦ dimensioning: — linear, radial, angular, diameter, tolerance ♦ symbols for sections ♦ hatching ♦ building construction ♦ third-angle projection system	**Drawing standards, protocols and conventions**	Applying recognised drawing standards, protocols and conventions in engineering and construction, including symbols and standards. ♦ line types: — dimension lines, centre line, hidden detail, cutting planes, fold lines ♦ dimensioning: — linear, radial, angular, diameter, tolerance ♦ symbols for sections ♦ hatching ♦ building construction ♦ third-angle projection system
Geometric shapes and forms	Spatial awareness when interpreting geometric shapes and forms, and/or those used in the communication of products, components, assemblies and other items. ♦ interpenetration ♦ intersections of right prisms and cylinders ♦ true shapes ♦ ellipses ♦ common geometric forms and partial cuts of those forms ♦ components built from various simple combinations of forms	**Geometric shapes and forms**	Producing graphics representing products, components, assembly and other items. ♦ interpenetration ♦ intersections of right prisms and cylinders ♦ true shapes ♦ ellipses ♦ common geometric forms and partial cuts of those forms ♦ components built from various simple combinations of forms

Question paper (knowledge and understanding)		Assignment (skills)	
Views and techniques	The role, benefits and use of a variety of views and techniques in 2D and 3D formats: ♦ communicating geometric shapes, objects and forms ♦ components ♦ assemblies ♦ third-angle orthographic projection ♦ tangency (internal and external radii location) ♦ true lengths and true shapes ♦ surface developments ♦ a range of sectional views (full, part, revolved, and stepped) and cut-aways ♦ assembly drawings (minimum three parts) ♦ auxiliary views ♦ exploded views (full and sectioned) ♦ oblique, isometric and planometric views ♦ use of appropriate scales	**Views and techniques**	Appropriate selection and use of 2D, and 3D and pictorial views and techniques, when producing graphic communications: ♦ third-angle orthographic projection ♦ tangency (internal and external radii location) ♦ true lengths and true shapes ♦ surface developments ♦ a range of sectional views (full, part, revolved, and stepped) and cut-aways ♦ assembly drawings (minimum three parts) ♦ auxiliary views ♦ exploded views (full and sectioned) ♦ oblique, isometric and planometric views ♦ use of appropriate scales
		Techniques in sketching (paper-based and/or using electronic tablets or similar devices)	Applying electronic and/or manual sketching techniques: ♦ proportion ♦ line quality ♦ vanishing points ♦ line sketching using related orthographic views ♦ single- and two-point perspective ♦ oblique and isometric forms
Illustration techniques	The use of illustration techniques used to support effective graphic communications. The use and role of, and common techniques for representing: ♦ light ♦ shadow ♦ reflection ♦ tone ♦ layout ♦ material ♦ texture	**Illustration techniques using manual and/or computer-aided formats**	Using illustration techniques to create effective and informative graphic communications for representing: ♦ light ♦ shadow ♦ reflection ♦ tone ♦ layout ♦ material ♦ texture Visual enhancement techniques

Question paper (knowledge and understanding)		Assignment (skills)	
	3D-rendering techniques: ♦ light source ♦ materials ♦ reflections ♦ shade ♦ sited environment		Creating scenes that place 3D models in relevant contexts.
Techniques used for producing effective promotional documents and publications	Techniques used in producing promotional documents and publications: ♦ colour theory: — warm, cool, contrast, harmony, accent, advancing and receding ♦ design elements and principles: — line, shape, texture, value, mass/weight, alignment, balance, contrast, depth, dominance, emphasis, proportion, rhythm, unity/proximity, white space, grid structure	**Producing effective promotional documents**	Applying and using: ♦ colour theory: — warm, cool, contrast, harmony, accent, advancing and receding ♦ design elements and principles: — line, shape, texture, value, mass/weight, alignment, balance, contrast, depth, dominance, emphasis, proportion, rhythm, unity/proximity, white space, grid structure Techniques used to create promotional documents and graphic displays. Presenting research/investigation and generating ideas for work to support/justify a graphic communication proposal.
Using technology in graphic communication	Ranges, features and use of graphic hardware and software computer systems and networks: ♦ file management ♦ cloud computing ♦ cloud storage ♦ digital rights management ♦ digital input and output devices ♦ advantages and limitations of CAD		
Computer-aided design (CAD)	Generic techniques, customs and practices used across a range of packages: ♦ 2D-drawing tools: — line, circle, rectangle, ellipse, trim, array (linear, box and radial), offset, mirror, project edge, extend, fillet, chamfer ♦ modelling features: — extrude, revolve, loft, helix, extrude/sweep along a path ♦ modelling edits: — shell, fillet (regular/irregular), chamfer (regular/irregular), mirror,	**Computer-aided design (CAD)**	Applying generic techniques, customs and practices used across a range of 2D and 3D CAD packages: ♦ 2D-drawing tools: — line, circle, rectangle, ellipse, trim, array (linear, box and radial), offset, mirror, project edge, extend, fillet, chamfer ♦ modelling features: — extrude, revolve, loft, helix, extrude/sweep along a path ♦ modelling edits: — shell, fillet (regular/irregular), chamfer (regular/irregular), mirror,

Question paper (knowledge and understanding)		Assignment (skills)	
	array (linear, box and radial), add, subtract, intersect ♦ 2D constraints: — linear, radius, diameter, perpendicular, parallel, fixed, tangent, concentric ♦ terminology: — component, assembly, sub-assembly, work-plane/plane, axis, feature, profile, sketch, face, edge, datum, suppress ♦ assembly: — 3D constraints (mate, align, centre axis, orientate, offset, tangent), stock/library components ♦ modelling concepts: — top-down modelling, bottom-up modelling, vertices, edges and faces, modelling tree/hierarchy, modelling plan ♦ file types: — dxf, 3ds, step/iges ♦ CAD libraries: — use and function of CAD libraries and stock models		array (linear, box and radial), add, subtract, intersect ♦ 2D constraints: — linear, radius, diameter, perpendicular, parallel, fixed, tangent, concentric ♦ terminology: — component, assembly, sub-assembly, work-plane/plane, axis, feature, profile, sketch, face, edge, datum, suppress ♦ assembly: — 3D constraints (mate, align, centre axis, orientate, offset, tangent), stock/library components ♦ modelling concepts: — top-down modelling, bottom-up modelling, vertices, edges and faces, modelling tree/hierarchy, modelling plan ♦ file types: — dxf, 3ds, step/iges ♦ CAD libraries: — use and function of CAD libraries and stock models
Desktop publishing (DTP)	Generic DTP terms and techniques including: ♦ planning strategies: — thumbnails, visuals and annotation ♦ generic DTP terms and techniques: — copy/paste, import/export — single- and multi-page format — page size, orientation, grid, guides, snap, master page layers, document sizing — cropping (square and full cropping), rotate, text box, handles, text wrap, flow text along a path, extended text — colour fill, colour picking, textured fills, gradient fill, transparency, drop shadow — serif, sans serif and script fonts, font styles, placeholder text (lorem ipsum), reverse, drop caps — column, margin, gutter, caption, header, running headline, heading, title, footer, folio, column rule/rule, indent, hanging indent, line spacing, pull quote, justification — proofs (pre-press), registration marks, crop marks, bleed ♦ file types: — raster (tiff, jpg, png, bmp), vector (svg, dxf) and their features	**Desktop publishing (DTP)**	Applying and using generic DTP terms and techniques including: ♦ planning strategies: — thumbnails, visuals and annotation ♦ generic DTP terms and techniques: — copy/paste, import/export — single- and multi-page format — page size, orientation, grid, guides, snap, master page layers, document sizing — cropping (square and full cropping), rotate, text box, handles, text wrap, flow text along a path, extended text — colour fill, colour picking, textured fills, gradient fill, transparency, drop shadow — serif, sans serif and script fonts, font styles, placeholder text (lorem ipsum), reverse, drop caps — column, margin, gutter, caption, header, running headline, heading, title, footer, folio, column rule/rule, indent, hanging indent, line spacing, pull quote, justification — proofs (pre-press), registration marks, crop marks, bleed ♦ file types: — raster (tiff, jpg, png, bmp), vector (svg, dxf) and their features

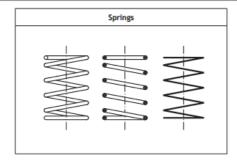| Question paper (knowledge and understanding)		Assignment (skills)	
Graphic communication technology and society	The impact and influence of CAD systems and graphic communication technologies on industry and society: ♦ the paperless office ♦ use of recycled materials ♦ CAD, as it supports manufacturing and other industries ♦ DTP in marketing and promotional activities ♦ remote working ♦ communication crossing international boundaries		
		Safe working	The safe working practices and systems that support graphic communication activities in studios and other working environments.

Technical graphic line types

These are the technical graphic line types that you should use in your work.

Outline solid	Projection line	Hidden detail line	Centre line
Continuous thick line for visible edges and outlines.	Continuous thin line for projecting between views.	Dashed thin line for hidden detail.	Long dash, dot, chain line for centres of symmetry. Please note that BS (7)308 (long dash, short dash chain) is also acceptable.

Fold line	Cutting plane	Knurling
Thin long dash, double dot, chain line to indicate folds on surface developments. BS (7)308 (long dash, short double dash chain) is also acceptable)	Long dashed dotted thin line, thick at ends. Please note that BS (7)308 (long dash, short dash (chain) line thick at ends is also acceptable.	

Springs

Building drawing symbols

These symbols are drawn from BSI.

You may be required to use these symbols in your assignment or project, or be asked questions about them in your exam.
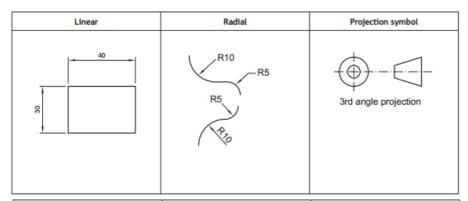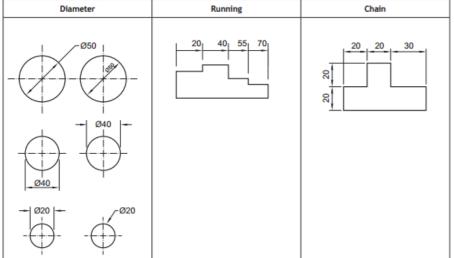
You **must** use the symbols and terms specified below.

Lamp	Switch	Socket	Radiator

Shower tray	Bath	Wash basin	Sink	WC

Sinktop	Heated towel rail	Concrete	Brickwork

Door	Sawn timber	Insulation board	Blockwork

Fixed window	Window–hinged at side	Window–hinged at top	Window–hinged at bottom
F			

Window–pivoted, horizontal axis	Window–sliding horizontally	Drainage	North sign

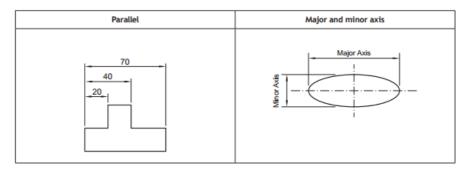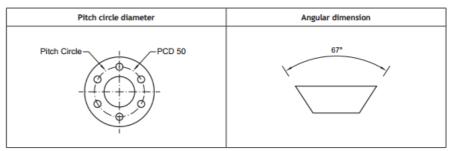| Existing tree	Existing tree–to be removed	Proposed tree	Contours

Dimensioning terms

These are the conventions for technical graphic dimensioning that you should use in your work.

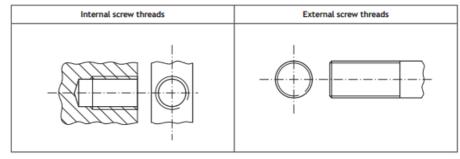| Leader line	Across corners	Across flats	Square
Dimension Line Extension Line Gap Ø30 Leader Line	75AC	60AF	□30

Linear	Radial	Projection symbol
40 30	R10 R5 R5 R10	3rd angle projection

Diameter	Running	Chain
Ø50 Ø50 Ø40 Ø40 Ø20 Ø20	20 40 55 70	20 20 30 20 20

Parallel	Major and minor axis
70 40 20	Major Axis Minor Axis

Pitch circle diameter	Angular dimension
Pitch Circle — PCD 50	67°

Internal screw threads	External screw threads

Tolerances

Common tolerance	Asymmetrical tolerance	Symmetrical tolerance	Functional tolerance	Non-functional tolerance
30,95 30,55	+0,35 30 − 0,55	$30 \pm 0,15$	F	NF
The **Common** method shows the upper limit of the size placed above the lower limit.	The **Asymmetrical** method shows the nominal size plus the upper and lower limits of the tolerance.	The **Symmetrical** method shows the nominal size and the symmetrical tolerance expressed as a plus and minus.	A dimension that is **essential** to the function of a component or space.	A dimension that is **not essential** to the function of a component or space.

3D CAD terms

3D CAD is an important aspect of Graphic Communication and you will be expected to demonstrate skill in using it throughout the Courses.

You will be required to answer questions about 3D CAD in your exam. You may be using terms pertaining to a specific software platform, however, you should know these generic terms for 3D CAD.

These terms can be found in the Course Assessment Specifications for the Graphic Communication Courses. Candidates and centres should note that these are **not the only** terms to be covered at these levels.

At National 4 and 5

Extrude	Revolve	Subtract	Assembly
The term used when a 2D profile is pulled into a 3D shape. The term add or subtract must be used to describe the function of the extrude.	A profile that is rotated around an axis.	Used in conjunction with features to describe material being removed from a 3D model.	Multiple components combined to create a model.

Fillet	Chamfer	Shell	Materials
A rounded edge applied to a corner. Can be applied in either the sketch or as a stand-alone feature.	A straight edge applied to a corner. Can be applied in either the sketch or as a stand-alone feature.	Used to remove material from the inside of a 3D model to a specifed wall thickness. It can also be used to remove a face.	Apply a material to a CAD model. This can be used for illustration or to conduct a CAD simulation or test.

Align	Centre axis	Component	Mate
To align the face of a 3D model with another face.	To align cylindrical objects, circular edges or circular faces.	A single component part, used to create an assembly later on.	To join the face of a 3D model to another face.

CAD library	Sketch
A directory of commonly used parts.	The name given to the CAD drawing feature used to create a profile.

At Higher, in addition to those at National 4 and 5

Orientate	Offset	Offset – (2D CAD)
Constrains faces, straight edges, or workplanes at an angle.	Mates or aligns two faces or workplanes by making their planes parallel and constraining the separation distance between the planes.	Is used to create parallel copies of sketch objects, lines, or curves at a specified distance from the original.

Constraint	Add	Profile
Dimension tool used to lock 2D geometry to a particular shape, size or position.	Used in conjunction with features to describe an addition to the 3D model.	The name given to a 2D shape, prior to being used to make a 3D feature.

Radial Array	Workplane	Array	Projected edge
An item repeated in a circle with regular spacing.	A surface where sketches can be applied. Most CAD packages will provide three (elevation, end elevation and plan), but more can be added by the user.	A method of repeating a shape along a line, in a box or round a circle.	To select an edge from a CAD model or feature and generate it as a new line in a sketch.

Fixed	Vertices	Edge	Faces
To hold a 3D CAD model in a fixed point, without applying any constraints. Usually applied to the first component in an assembly.	The "corners" or where edges meet on a 3D object.	The edges of a 3D object.	The face of a 3D object.

Loft	Irregular fillet	Linear array	Box array
A command where two or more profiles on workplanes that are spaced apart, are joined to create a 3D feature.	A rounding of an edge, where the radius will change.	An item repeated along an edge, with regular spacing.	An item repeated in a square or rectangle, with regular spacing.

Irregular chamfer	Helix	Extrude along a path	Intersect
The removal of an edge by a cut, where the distance changes along the length of the edge.	A profile that revolves around an axis, but has an offset or pitch' distance. Often used to model threads, screws or springs.	A profile that has been extruded by following a set route or 'path'.	Two 3D CAD features that pass through one another, with the result that only the area that the two touch remains. Everything else is deleted.

Light source	Reflection	Bottom up modelling	Top down modelling
The source of light to illuminate a 3D CAD model and scene.	A reflection in material, colour or light on the 3D CAD model or in the scene.	Bottom up modelling is when parts are modelled then inserted and fixed in relation to other components in an assembly using mates.	Top down design is an option to create new parts within assembly. Constraints are the existing geometry elements from other parts within assembly: lines, planes, surfaces, points, vertices.

Axis	Datum	Sub-assembly	Suppress
An axis represents a line travelling in a direction. Typically these are X, Y and Z but can be combinations.	A key point in which dimensions, sizes and other details are taken from.	An assembly of components that is added to another, larger assembly.	To turn a feature or command off within the modelling tree.

Solid model	Wire frame	Modelling tree	Sited environment
An object that can be viewed from any angle, geometry created within 3D space.	A method of presenting a 3D CAD model, showing only the edges. Faces are transparent.	The linear hierarchy of how a 3D CAD model is created or assembled.	An environment that represents how the 3D CAD model would look in a realistic environment.

STEP/IGES
STEP and IGES files are a method of sharing 3D CAD components and assemblies between CAD platforms. Widely used for stock or library components.