

Computer Aided Design (40-assignment)



This is an integrated instructional module designed specifically to operate within the LJ ScanTEK Modular Technology Program environment. It includes a 10-assignment exploratory curriculum and a further 30-assignment in-depth curriculum. The exploratory curriculum and the in-depth curriculum are each split into two parts. Each part includes a pre-test and post test. The module includes hardware, software and curriculum materials sufficient to provide a complete learning experience.

The curriculum incorporates continuous assessment through questions. When used in conjunction with a ClassAct networked management system, this provides instant feedback of student performance. The assessments begin with a comprehensive pre-test. This quiz includes questions for each subsequent assignment, together with questions that will specifically test math and reading ability.

Every assignment starts with a series of questions designed to track inventory. These ensure that any missing items are located before they are needed.

Each assignment is divided into a series of tasks. Hands-on tasks form the core of the student work. Where appropriate, these are accompanied by research tasks based upon illustrated textbooks and on-screen applications. Assessment questions are incorporated into each task.

Typical 10-assignment topic areas include:

- Introduction to AutoCAD
- Absolute and relative co-ordinates
- Kitchen plan design
- Drawing in orthographic projection
- Z axis and three-dimensional graphics
- Redesigning a component part
- Architectural and mechanical drawings
- Manufacturing and production
- Scale and grids in CAD
- Snap to grid
- Line, Offset, Trim, Fillet and Mirror commands
- Printing drawings
- Circle, Arc, Zoom and Copy commands
- Polyline and Array commands.

Typical 10-assignment activities include:

- Recognize how CAD can replace traditional drafting methods.
- Examine sample CAD files.
- Extract information from a CAD Tutorial.
- Investigate absolute and relative co-ordinates.
- Recognize how 2-dimensional co-ordinate systems are used in CAD.
- Describe the role of CAD in a design and production process.
- Determine how CAD packages are used in the field of architecture.
- Recognize how to set up the design area for CAD drawings.
- Draw a kitchen plan.
- Investigate basic line conventions used in drafting.
- Discover the standard way that objects are drawn for manufacturing purposes.
- Examine the principles of orthographic projection.
- Draw the top and front view of a component part.
- Draw an orthographic projection.

Typical 10-assignment activities include (continued):

- Investigate 3-dimensional co-ordinate systems.
- Draw a 3D mechanical component.
- Follow a design brief to design a component part.

Typical 30-assignment topic areas include:

- Shape commands
- Printing drawings
- AutoCAD editing commands
- Co-ordinates
- Orthographic projection
- Projection symbols
- Representing 3D objects in 2D
- Polar co-ordinate system
- Polygons and ellipses to draw architectural symbols
- Fillets and chamfers
- The trim and extend commands
- Mirroring objects
- Red hot grips
- Viewports
- Printing preparation
- Using blocks and snaps
- Linear and radial dimensions
- Using layers to organize a drawing

Typical 30-assignment activities include:

- Explain how to magnify areas of a drawing.
- Determine all the information that needs to be included in any drawing.
- Recognize how to organize drawings correctly.
- Identify how to print out drawings.
- Recognize how 2-dimensional co-ordinate systems are used in CAD.
- Determine how 3-dimensional objects are presented in 2-dimensional drawings.
- Explain the definition of orthographic projection.
- Distinguish between first and third angle projection.
- Draw an orthographic projection of a dice.
- Recognize the correct projection symbol for an orthographic drawing.
- Produce realistic 3-dimensional drawings.
- Recognize the difference between oblique, axonometric and isometric views.
- Set up an isometric grid.
- Draw isometric views of different blocks.
- Explain the polar co-ordinate system.
- Use polar co-ordinates to draw an object.
- Recognize that most CAD drawings are based on simple geometrical shapes.
- Use simple shapes such as polygons and ellipses to draw architectural symbols.
- Explain what a fillet is.
- Use the fillet command to edit a drawing.
- Explain what a chamfer is.

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Typical 30-assignment activities include (continued):

- Determine how to change the size of a fillet or chamfer.
- Use editing commands to complete an architectural drawing of a door.
- Use the trim command to edit a drawing.
- Use the extend and offset commands to edit a drawing.
- Investigate grip editing to change a drawing.
- Mirror objects within a drawing.
- Move an object within a drawing.
- Scale an object within a drawing.
- Copy and reposition an object within a drawing.
- Recognize the editing commands needed to complete a drawing of a small aircraft.
- Customize a drawing to suit specific requirements.
- Determine how to create different viewports within a drawing.
- Recognize how blocks and symbols can simplify a drawing.
- Insert blocks into a drawing of a house.
- Define an object snap.
- Determine the benefits of using object snaps when drawing.
- Distinguish between various object snaps.
- Interpret the standard rules for dimensioning.
- Add linear and radial dimensions to a drawing.
- Recognize the types of dimensions offered in CAD packages.
- Use relevant dimensions to complete a drawing.
- Interpret various two and three-dimensional drawings.
- Explain the different types of lines used in drafting.
- Set up layers within a drawing.
- Determine how layers can simplify the drafting process.
- Complete a drawing on different layers.
- Follow a design brief to sketch the orthographic projection of a component.
- Set up the drawing to meet the specific requirements of a design brief.
- Complete the front elevation of the component.
- Complete the left elevation of the component.
- Dimension and print out the component to complete a lengthy design project.

Each assignment is designed around a list of performance objectives. These lists include academic, technical and occupational objectives. The assignments are written in such a way as to enable a student to attain the performance objectives, with the assessment questions linked to these in order to provide a measure of true competency.

The performance objectives are used by the ClassAct management system to generate a comprehensive portfolio of student competency reports. Default reports supplied with this module include:

- Entry report
- Technical/Occupational Exit report
- Basic Skills report based upon the federal SCAN's report.

The items supplied with this instructional module include:

- 10-assignment On-Screen Student Assignment Guide CD
- 10-assignment Student Assignment Guide
- 10-assignment Student Workbook
- 10-assignment Instructor's Guide
- 30-assignment Student Assignment Guide
- 30-assignment Student Workbook
- 30-assignment Instructor's Guide
- Computer Aided Instruction Software
- Symbols Reference Sheet
- AutoCAD
- Glossary of Commands
- Printer
- Drawing techniques factsheet
- Robot jaw
- Ruler
- Design block kit

Additional items required:

- Computer

Module Facts

For Technology Program, order as:
ST130/40 Computer Aided Design

	No.	Average time
Assignments	40	45 minutes
Extension Activities	5	45 minutes
Total		33¼ hours



LJ Technical Systems
Web site: www.ljgroup.com

Ref No. P5007-F