

IDP 150: INTRODUCTION TO AUTOCAD

JANUARY TERM 2014

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OVERVIEW: Computer Aided Design (CAD) programs offer engineers, architects, landscape architects and other professionals powerful tools to model complex objects and generate clear plansets. This workshop is designed to help students build the necessary skills in AutoCAD, the most popular CAD program, to be competitive applicants for internships and entry-level jobs in architecture, landscape architecture, and engineering. Students in this course will have the opportunity to achieve **basic technical proficiency in 2D AutoCAD** over the course of four very full days. This is a fast-paced workshop and is appropriate for students with a strong general computer background who wish to build skills and working knowledge of the latest 2D AutoCAD application.

SCHEDULE: *January 7,8,9 and 10, 2014. 9:00 AM to 4:00 PM, LUNCH 12p-1p.*

This workshop covers basic commands and concepts of the 2D AutoCAD platform. Each day we will explore the capabilities and processes of this program through a series of short demonstrations followed by exercises and assignments. Generally mornings will be instruction heavy with the afternoons given to students to work on daily assignments with the support of the instructor. On the last day, students will work on laying out a full construction set of drawings based on completed assignments from the first four days.

REQUIRED MATERIALS: Please bring a ruler or scale; a notebook; and pen or pencil each day. Students with AutoCAD installed on their laptops may wish to bring them to class. You will need to be able to save your drawings each day. You may use your H: drive or a flash drive. No text is required for the course.

COMPUTER LAB POLICIES: Bass 103 will only be reserved for our use during our scheduled workshop time. You may be able to access the lab on your own time beyond our scheduled time, but there is no guarantee of this. You may not bring any food or drink into the Lab.

The schedule outlined on the following pages describes the of topics, assignments, and tasks for each day. I may choose to adjust the schedule and assignments to better accommodate the needs and pace of the class.

ASSIGNMENTS & EVALUATION: The workshop format of this class requires **full participation and attendance**. Assignments must be completed in full and submitted in **both** hard and digital formats to the location specified in class no later than 12p, January 12th.

DAY ONE: GETTING STARTED AND DRAWING BASICS

The first day of class will acquaint you with the CAD user interface, basic drawing techniques, and file management.

□ INTRODUCTION:

- What can AutoCAD do and why learn it?
- Logon & start up
- Demystifying the interface
 - Options: setting up your working environment
 - Learning about Command Line (CTRL+9), Ribbon Menus, and Tool Flyouts
 - Setting preferences, units, file handling, drafting options
- Navigation tool bar

□ Basic **DRAWING TOOLBARS & TECHNIQUES** (and how to use the mouse)

- DRAWING PANEL:
 - Circle (C)
 - Rectangle (REC)
 - Polygon (POL)
 - Polylines (PL) vs. Lines (L)
 - Polyline Arcs
- MODIFY PANEL:
 - Select
 - Move (M) and Copy (CO)
 - Erase - Delete
 - Trim (TR) and Extend (EX)
 - Undo (U or CTRL+Z) and Redo
- DRAWING CONTROLS
 - Grid and Limits (F7)
 - Object Snaps (F3)
 - Ortho (F10)

□ **DRAWING SETUP** and Management

- Paper Space & Model Space
- New and Open Using a Template
- Command Line Layout
- Set units
- Set up layers
- Saving the drawing

□ Working with an existing drawing - open examples

- File Management Issues and Techniques
 - **OBJECT PROPERTIES:** Area, List, Distance, Regenerate
 - **LAYER PROPERTIES (MO)** & Quick Properties (Ctrl+Shift+P)
 - Setting up Layers + Variables
 - Freezing Layers
 - Layer Purge
 - File Names

IN-CLASS EXERCISE 1: Create 6 graphic designs using simple geometry as directed in class

ASSIGNMENT 1: A. Research your assigned tool. B. Create a simple basemap of your house, a favorite place, or your dorm.

DAY TWO: TECHNIQUES FOR EVERYDAY DRAFTING

- Creating accurate drawings using:
 - Pedit (PE)
 - Spline and Spline edit
 - Stretch (Grips)
 - Fillet
 - Distance & Length (Direct Distance Controls)

- Shortcuts to drawing and editing
 - Offset (O)
 - Mirror (MI)
 - Array
 - Blocks (creating, inserting and modifying)
 - Explode (blocks, pline)
 - Break
 - Rotate
 - Scale
 - Align
 - Inserting an image to trace

ASSIGNMENT 2A: Creating an advanced drawing: complex landscape, building façade/section, or engineered object

TASKS: Set up the drawing and recreate the plan(s) distributed during class

- Adding text, dimensions, and details to a drawing
 - WBLOCK
 - Layer Properties and Lineweights
 - Text & Text Styles
 - Mtext – Multi-line Text
- Dtext – Dimension Text
- Text edit
 - Setting a Dimension Style
 - Linear Dimensions
 - Aligned Dimensions
 - Angular Dimensions
 - Leader Lines and Leader Styles
 - Hatch and Hatch edit

ASSIGNMENT 2B: Labeling, hatching and dimensioning a drawing- continued on the drawing produced in the morning. IDP 150: Introduction to AutoCAD

DAY THREEDAY 3: PRODUCING DRAWINGS FOR CLIENTS AND OTHER PROGRAMS

- Importing/Exporting Files:
 - Wblock
 - Images & PDF's (Insert→Attach
 - Xrefs (discuss only)

- Model Space/Paper Space Layouts
- Line weights and Line types in model space & Paper Space
- Grayscale vs. Monochrome Lines
- Plotting Settings – Page Set-up Manager
- Plot Styles
- Drawing in Paperspace – Titleblock
- Inserting blocks and images onto a Layout
- Drawing construction details
 - Standards
 - Controlling Leaderline text
 - Hatching review

- Tag Attributes with Blocks
- Plotting to PDF

ASSIGNMENT 3:

1. Create a detail label with number, title, and sub-title with dynamic attribute tags
2. Create a title block with dynamic attribute tags for the Construction Document Project
3. Draw two construction details

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DAY FOUR: CONSTRUCTION DOCUMENTS AND PLAN SETS

PROFESSIONAL APPLICATIONS OF AUTOCAD

- Construction details
- Creating a set of drawings: office practices
- Keeping drawings organized
- Drawing Templates
- Plotting

FINAL ASSIGNMENT: Construction Document Project

- Cover Sheet
- Illustrative Plan
- Annotated Site Plan (or Equivalent)
- Dimension Plan, Layout Plan (or Equivalent)
- Planting Plan or other specialized plan
- Detail Sheet

Optional content, which may be added by the students:

- Cross Section
- Photoshop Rendering
- 3D Model

RESOURCES FOR FUTURE USE & LEARNING:

Software:

AutoCAD WS: A free, cloud-based version of ACAD that allows you to view and modify existing drawings.

Draftsight: A professional-grade, free clone of ACAD. Compatible with ACAD. www.3ds.com/products/draftsight/

On-line Tutorials and Reference

CadVideoTutorials: Extensive cache of frequently updated, step-by-step YouTube videos for AutoCAD 2012

Cadalyst: Great website for trouble shooting AutoCAD issues www.cadalyst.com

MyCADSite: A complete free AutoCAD training course online in 52 tutorials www.we-r-here.com/cad

Suggested Texts:

AutoCAD 2011 and AutoCAD LT 2011 / Donnie Gladfelter / Sybex / ISBN: 9780470602164. A **free e-book copy** is available [online here](#) through the UMass library system. (You may have to log on using your OIT NetID and password.)

SketchUp for Dummies / Aidan Chopra / For Dummies Publishers (introductory SketchUp book by a great author – but with an awful title). A **free e-book copy** is available [online here](#) through the UMass library system.

Optional Literature - AutoCAD:

Mastering AutoCAD 2011 and AutoCAD LT 2011 / Omura / Sybex (in-depth resource)

AutoCAD and AutoCAD LT 2011 / Finkelstein / John Wiley & Sons (more in-depth AutoCAD reference and tutorials)

STANDARD PAPER SIZES

STANDARD IMPERIAL (IN) METRIC (MM)

ARCH A 9 x 12 229 x 305
ARCH B 12 x 18 305 x 457
ARCH C 18 x 24 457 x 610
ARCH D 24 x 36 610 x 914
ARCH E 36 x 48 914 x 1219
ANSI A * 8.5 x 11 216 x 279
ANSI B * 11 x 17 279 x 432
ANSI C 17 x 22 432 x 559
ANSI D 22 x 34 559 x 864
ANSI E 34 x 44 864 x 1118
ANSI F 28 x 40 711 x 1016
ISO A6 4.13 x 5.83 105 x 148
ISO A5 5.83 x 8.27 148 x 210
ISO A4 8.27 x 11.69 210 x 297
ISO A3 11.69 x 16.54 297 x 420
ISO A2 16.54 x 23.39 420 x 594
ISO A1 23.39 x 33.11 594 x 841
ISO A0 33.11 x 46.81 841 x 1189
JIS B6 5.57 x 7.17 128 x 182
JIS B5 7.17 x 10.12 182 x 257
JIS B4 10.12 x 14.33 257 x 364
JIS B3 14.33 x 20.28 364 x 515
JIS B2 20.28 x 28.66 515 x 728
JIS B1 28.66 x 40.55 728 x 1030
ISO B6 4.92 x 6.93 125 x 176
ISO B5 6.93 x 9.84 176 x 250
ISO B4 9.84 x 13.90 250 x 353
ISO B3 13.90 x 19.69 353 x 500
ISO B2 19.69 x 27.83 500 x 707
ISO B1 27.83 x 39.37 707 x 1000
ISO B0 39.37 x 55.67 1000 x 1414