Stony Brook University
Sustainability Studies program

Course Syllabus

Course Title: SBC 354: Drawing for Design
Instructor: Greg Tarquinio
Earth & Space Sciences Building: Room ESS081
Date Course Begins: 8-26-13
No. of Sessions: 32
Date Course Ends: 12-18-13
Email: Gregory.Tarquinio@stonybrook.edu

Course Description: Techniques and Theory of Drawing; Architectural Drawing; Learning Computer Assisted Design (CAD). This course will serve as an introduction to CAD tools relevant to design and architectural rendering.

Course Prerequisite: SBC 117

Course Objectives:

The 2014 version of AutoCAD software will be used in this course. Students will start with the basic commands in AutoCAD and work their way up to more advanced applications through required drawings assignments and a final project. The goal of this course is to not only teach the students how to draw in the latest version of AutoCAD, but to apply the AutoCAD techniques used today to produce a set of working drawings for bidding & construction purposes. Examples of these types of construction/bidding drawings will be shown and discussed as well as a site visit to various campus projects that were drawn and built off of AutoCAD produced drawings.

Course Outcomes:

1. Develop an understanding of works of art and their practitioners through an examination of the works in the historical and cultural context in which the art was or is created.
2. Understand the materials, forms, and/or styles of art through study of arts theories and the works themselves.
3. Understand ideas, materials, technical skills, and forms of art in order to express oneself creatively through an artistic medium.
4. Develop tools of aesthetic discourse through contact with works of art – as well as through writings on art – related to its critical understanding, cultural placement, and appreciation.

Grading / Evaluation:

Grading breakdown is as follows:
- Attendance 32%
- 18 Drawing Assignments 36%
- Final Project 32%
- Total 100%

Attendance and Make Up Policy:
Attendance results in 32% of your grade. Students are expected to attend all classes. For each class missed, one point will be deducted. No more than (3) absences will be allowed. Late arrivals and early departures will result in a lower attendance grade. The student will be responsible for covering all material missed during his/her absences.

Schedule:

Lesson #1 - Starting AutoCad/Application Windows
Monday 8-26-13

- Introduction
- Review School Procedures – Posted on Blackboard
- AutoCAD Startup
- Application Menu (pg. 1-6)
  - New (pg. 2-16)
  - Drawing Utilities / Drawings Setup / Units (Click on “Save as Default”)
    - Units (pg. 4-14)
    - Limits (pg. 4-10)
  - Open (pg. 2-17)
  - Save (pg. 2-19)

Save As
- Print
- Close
- Scale, Recover
• Autocad Application Window: (pg. 1-4)
• Quick Access Toolbar (pg. 1-9) – Favorite / Frequently Used Command. Add More Commands or Customize – Use Drop Down Button. Old Method (Pulldowns) - Show Menu Bar
• Tabs (pg. 1-10)
  Dock / Undock
    Ribbon Tabs Visual Options Drop Down Button
• Panels (pg. 1-10)
  Display Commands
  Pinning Open
  Moving Panels (Click and hold Panel Title. (Make sure Lock Icon is Unlocked on Status Bar)
• Status Bar (pg. 1-11) – Right Mouse Click (Use Icons or Names)
  Cursor Coordinate Values - Coordinates – F6 doesn’t work, click on & off
  Infer Constraints – Use for 3D
  Osnap Commands (F3) (pg. 4-2)
  Snap (F9) (pg. 3-7) – Set to 10’
  Grid (F7) (pg. 3-7 & pg. 4-12) – Set to 10’ / Remove “Display Grid Beyond Limits”
  Ortho (F8) (pg. 2-11)
  Polar Tracking (F10) (pg. 11-8)
  Object Snap (F3) (pg. 4-3)
  3D Object Snap (F4)
  Object Snap Tracking (F11)
  Dynamic UCS (F6)
  Dynamic Input (F12) (pg. 11-4 & Appendix C-1) Show Command Prompting in Settings Box, Disable Dimension Input. Set to Polar Format & Relative Coordinates
  LWT - Lineweight
  Show/Hide Transparency (Hatching)
  Quick Properties
  Cycling - Use for 3D
  Annotation Monitor
  Paper Space / Model Space
  Quick View Drawings
  Annotation Scale
  Annotation Visibility
  Workplace Switching
  Toolbar/Window Positions Locked
• Help Button - Use Info Center (pg. 1-18) Select Question Mark
• View Controls – Set to Top (Top left-hand Corner of Screen)
• Crosshairs, UCS Icon
• View Cube (pg. 1-19) Turn off
• Navigation Bar (pg. 1-19) Turn Off (NAVBAR Sevtar Command)
• Quick View Icon at Bottom of Screen to Toggle between Drawings
• AutoSave (pg.2-20)

Lesson #2 – Drawing Objects
Wednesday 8-28-13
• Drawing Objects:
  Ortho On (pg. 11-2)
    Line (pg. 2-10) - Arrow Down for Undo /M2P for Midpt. Between to lines (pg.11-2)
    Erase (pg. 2-4)
    Undo/Redo (pg. 2-15)
    Circle (pg. 3-2) - Arrow Dn. for Diameter
    Rectangle (pg. 3-4) – Arrow Dn. for Dimensions
    Osnap Commands (pg. 1-12)
• List Properties Palette (pg. 12-4)
• Drawing Assignment: Fig. 7-12 (Drawing #1)

Lesson #3 - Drawing Assignments
Wednesday 9-4-13
Line Command Recap
Drawing Assignments:
• Fig. 7-13 (Drawing #2)
• Exercise 11A (pg. 11-12) (Drawing #3)
• Exercise 19A (pg. 19-9) (Drawing #4)

Lesson #4 – Layers & Linetypes
Monday 9-9-13
• Load Linetypes 1st (pg. 3-16) – (Home/Properties Panel),
Lesson #5 - Zooming & Panning
Wednesday 9-11-13

- Zoom Commands: (pg. 4-8)
  - Real-time Zoom
  - Window
  - Previous
  - All
  - Extents
  - In / Out
  - Center
  - Dynamic
  - Scale
  - Transparent Zoom

  *Back*
  *Forward*

- Pan Commands: (pg. 26-10)
  - Real-time Pan
  - Scrollbar Pan (Options/Display)
  - Transparent Pan

Lesson #6 - Drawing & Modifying Objects
Monday 9-16-13

- Drawing Objects:
  - Polygon (pg. 5-2)
  - Ellipse (pg. 5-3) – UseAxis/End
  - Ray – Put Polar Tracking On
  - Xline – Horizontal, Vertical, Angular
  - Polyline (pg. 23-2)
  - Edit Plines (pg. 24-2) (Modify Panel) – Use Reverse option for linetypes with upside down text
  - Spline / Edit Spline (Modify Panel)
  - Spline CV – Use this when you have distinct points to snap too.
  - Donut – (pg. 5-6)
  - Arcs (pg. 22-2)
  - Helix

- Modify Commands:
  - Offset (pg. 12-2) (Layer/Current)
  - Trim (pg. 6-4)
  - Extend (pg. 6-5)
  - Fillet (pg. 7-7) (Multiple)
Lesson #7 - Drawing Assignments
Wednesday 9-18-13
Drawing Assignments:
- Fig. 17-16 (Drawing #6)
- Fig. 16-22 (Drawing #7)
- Fig. 17-18 (Drawing #8)

Lesson #8 – Modify Commands
Monday 9-23-13
- Modify Commands:
  - Move (pg. 6-6)
  - Copy (pg. 7-2)
  - Mirror (pg. 7-5)
  - Rectangular Array (pg. 13-2) (Use Associative, Levels = 3D/Edit Array – Modify Panel)
  - Polar Array (pg. 13-5)
  - Path Array (pg. 13-9)
  - Edit Array (Must be Associative)
  - Rotate (pg. 14-4)
  - Scale (pg. 14-2)
  - Stretch (pg. 14-3)
  - Point (pg. 5-7) – In Utilities Panel or type in DDPTYPE for Point Styles
  - Divide (pg. 25-7)
  - Measure (pg. 9-7)
  - Blend Curve (Under Fillet)
  - Join (pg. 24-4)
  - Change Space (PS to MS) – Moves objects from Paperspace to Modelspace
  - Delete Duplicate Objects
  - Set to Bylayer
  - Align
  - Move/Copy/Rotate – Express Tools/Modify Panel
- Drawing Assignment: Fig. 18-15 (Drawing #9)

Lesson #9 - Hatching
Wednesday 9-25-13
- Hatch (pg. 15-2) Use Options Tab for Hatch box
- Hatch Types (pg. 15-9)
- Hatch Patterns (pg. 15-8)
- User Defined (pg. 15-9) Double
- Solid (pg. 15-10)
- Gradient (pg. 15-11)
- Hatch Bounderies (pg. 15-3)
- Associative / Non-Associative
- Annotative
  - Transparency
  - Hatch Edit (pg. 15-12)
- Properties (pg. 12-4) – Home / Properties Panel
- Drawing Assignment: Fig 19-8 (Drawing #10)

Lesson #10 – Object Selection, Grips
Monday 9-30-13
- Selecting Objects:
  - Pickbox (pg.2-13)
  - Window (pg.2-13)
  - Crossing Box
  - All
  - Last
  - Previous
  - Add / Remove
  - Wpolygon / Cpolygon
  - Fence
- Grips: Options/Selection for Grip Dialogue Box
- Noun/Verb Selection
- Implied Windowing
- Associative Hatch
- Utilities Commands: (pg. 9-7)
Lesson #11 – Text
Wednesday 10-2-13
- Text Style Box (pg. 26-22)
- Text Fonts
  Annotative (pg. 25-6)
  Single Line Text (pg. 8-2)
  Mtext – Multi-Line text (pg. 8-4 & pg. 25-4)
- Justifications (pg. 8-3)
- Tabs (pg. 8-6)
- Indents (pg. 8-6)
- Ruler
- Bold / Italic / Underlined / Strikethrough / Overscore
- Bullets
- Numbering
  a.b – Spacing between Words
  Obliqing Angle
  Width Factor
- Find & Replace (Use Down Arrow next to OK Button)
- Spell Check

Static Columns (pg. 8-7) - You control the # of Columns, Column Height & Gutter Spacing
Dynamic Columns (pg. 8-8) – The Column Height, Column Width & Gutter Spacing determines the # of Columns.

Symbols / Special Characters – (pg. 19-7)
- Drawing Assignments: Exercise 12B (pg. 12-10) (Drawing #11) & Fig. 21-4 (Drawing #12)

Lesson #12 – Dimensioning
Monday 10-7-13
- Dimensioning Commands:
- Dimension Styles (pg. 16-7)
- Dimension Sub-Styles (pg. 18-9) Use to get Arrowheads on Radius & Diameter dimensions
- Associative (pg. 16-2)
  Linear (pg. 16-4)
  Continue (pg. 16-5)
- Aligned (pg. 19-6)
- Dimension Break (pg. 17-8) Dimension Style Box/Symbols & Arrows for size of break
- Dimension Jog (pg. 17-11) DIMJOGLINE to Remove
- Baseline (pg. 16-6) Use Adjust Command to increase/decrease Baseline Spacing (Draw Drawing on pg. 20-6)
  Radius (pg. 18-4)
  Diameter (pg. 18-2)
  Angular (pg. 18-6)
  Arc Length (pg. 22-3)
  Center Mark (pg. 18-7)
- MultiLeader:
  Style (pg. 19-4) Straight Leaders
  Single Leader (pg. 19-2)

Lesson #13 – Drawing Assignments
Wednesday 10-9-13
- Drawing Assignments:
  - Problem 14 (Drawing #13)
  - Problem 29-5 (Drawing #14)
  - Problem 27 (Drawing #15)

Lesson #14 – Dimensioning
Monday 10-14-13
- MultiLeader:
  - Style (pg. 19-4) Spline Leaders / # of Points
  - Single Leader (pg. 19-2)
  - Adding Leaders (pg. 19-2)
  - Remove Leaders (pg. 19-3) Double Click Leader to Remove
Lesson #15 - Isometrics  
Wednesday 10-16-13
- Isometric Commands:
  - Isometric Snap (pg. 3-7)
  - Switching Isoplanes (Ctrl E, F5)
  - Isometric Circles (IsoCircles) – Use Ellipse Command - Axis, End
  - Oblique Dimensioning
- Practice Drawing – Exersize 11B (pg. 11-13)
- Drawing Assignments: Problem 32 (Drawing #17) & Problem 33 (Drawing #18)

Lesson #16 - Blocks & Symbol Libraries  
Monday 10-21-13
- Block Commands:
  - Write Block - Wblock (pg. 29-2) Insert Tab / Block Definition / Create Block Dropdown
  - Insert (pg. 29-6)
  - Explode (pg. 6-9)
  - Rename Blocks
  - Purge (pg. 29-9)
  - Copy and Paste
  - Copy Nested Objects (Modify Panel)
- Attributes
  - ATTDIA – Displays the Attribute Dialogue Box
  - ATTDEF – Defines Attributes to an object – Insert Tab / Block Definition / Define Attributes
  - ATTDISP – Displays the Attribute Value
- AutoCAD Design Center – View Tab / Palletes

Lesson #17 - External References (Xrefs)  
Wednesday 10-23-13
- External Reference Commands: Insert Tab / Reference
  - Xloadctl = 2 (Variable)
  - Attach - Insert Tab / Reference
  - Unload
  - Reload
  - Detach
  - Bind - Insert
  - Clip (Xclip) - Insert Tab / Reference
  - Save Path
  - Xref Fading
  - Xref Layers

Lesson #18 – Viewports  
Monday 10-28-13
- Viewport Commands:
  - Model Space (pg. 26-3)
  - New Layout (pg. 26-5) Sketch Borders / Layouts
  - Rename Layout (pg. 26-15)
  - Page Setup Manager (pg. 26-13)
  - Paper Space Viewports (pg. 26-6) Layout Tab / Rectangular / Polygonal
  - VP Layer
  - Viewport Scale (pg. 26-17)
  - Locking / Unlocking Viewports (pg. 26-12) Use Lock next to Viewport Scale Factor
- Viewport Layer Control
- VP Freeze in All Viewports except Current (Layers Panel)
- Practice Exersize 26B (pg. 26-28)

Lesson #19 - Xref & Viewport Exersize (pg. 29-18)  
Wednesday 10-30-13
- Drawing Assignment 29B (pg. 29-18) – Make this your Xref
Create Viewports with Different Scales – (pg. 29-21)

Lesson #20 - Printing and Plotting (pg. 26-18)  
Monday 11-4-13
- AutoCad Plot Commands:
  Add a Printer (pg. Appendix A1)
  Page Setup Manager (pg. 26-13) Layout Tab
  Plotter (pg. 26-19)
  Paper Size (pg. 26-19)
  Plot Area (pg. 26-19)
  Plot Origin
  Center the Plot (pg. 26-19)
  Plot Scale (pg. 26-19)
  Portrait or Landscape (pg. 26-20)
  Plot Style Table (pg. 26-20) Color-Dependent Plot Style / Monochrome Plot Style
  Plot Preview (pg. 26-20)

Lesson #21 – Site Visit  
Wednesday 11-6-13
- Class to be held at Roth Quad – Starbucks & Red Mango Site Visit

Lesson #22 – 3D Drawing & Concepts  
Monday 11-11-13
- 3D Commands:
  Draw Rectangle & Circle – Change Colors of each
  Viewports – View Tab / Model Viewports Panel / Viewport Configuration / Two Vertical
  Right Viewport – View Tab / View Panel / SW Isometrics
  Thickness – Home Tab / Properties Panel / Right Down Arrow
  Elevation - Home Tab / Properties Panel / Right Down Arrow
  Shading – View Tab / Visual Styles Panel
  Orbit & Continuous Orbit – View Tab / Navigate 2D Panel
  Right Click Mouse for Visual Aids: Compass / Grid UCS Icon
  Parallel/ Perspective

Lesson #23 – Express Tools  
Wednesday 11-13-13
- Express Tools Commands – Text Panel
  Arc Text – (pg. 30-2)
  Modify Text / Change Case (pg. 30-3)
  Convert Text to Mtext (pg. 30-4)
  Rotate Text (pg. 30-3)
  Text in Object (pg. 30-5)

- Express Tools Commands – Modify Panel
  Move/Copy/Rotate
  Stretch Multiple – Express Tools / Draw Panel

- Express Tools Commands – Layout Panel
  Break Line Symbol (pg. 30-6)

- Express Tools Commands – Draw Panel
  Break Line Symbol (pg. 30-6)

- Express Tools Commands – Draw Panel
  Command Aliases (pg 30-7) Tools Panel
  System Variable Editor - Setvar

Lesson #24 – Misc. Commands  
Monday 11-18-13
- Revision Cloud (pg. 21-4)
- Wipeout (pg. 21-7) Wipeoutframe Setvar Command
- Groups (pg. 30-8)
  Making PDF’s – Output Tab / Export to DWF / PDF Ribbon – Go to Options Button to Set Location
  Customizing – Manage / Customization / User Interface
  Split Screen with Multiple Drawings – View / User Interface / Tile Vertically

- Options:
  Files – Support Files Search Path (Adding Fonts) / Drawing Template File Location /
  Display – Screen Colors & Screen Layout Colors / Old Menus/ Crosshair Size
Lesson #25 – Creating a Template Drawing
Wednesday 11-20-13
- Creating A Template Drawing (pg. 2-2)
- Set Drawing Limits
- Set Units – Application Menu / Drawing Utilities / Drawing Setup
- Load Linetypes – Home Tab / Properties Panel / Linetype / Load / acad.lin File / Right Click / Open with Notepad
- Create Layers
- Template Command Checklist:
  - Regenauto
  - Mtrtext
  - Snapang
  - Highlight
- Save As a Template Drawing (pg. 2-4)

Lesson #26 – Drawing Assignment
Monday 11-25-13
- Final Project

Lesson #27 – Drawing Assignment
Monday 12-2-13
- Final Project

Lesson #28 – Drawing Assignment
Wednesday 12-4-13
- Final Project

Lesson #29 – Drawing Assignment
Monday 12-9-13
- Final Project

Lesson #30 – Drawing Assignment
Wednesday 12-11-13
- Final Project

Lesson #31 – Drawing Assignment
Monday 12-16-13
- Final Project

Lesson #32 – Final Class
Wednesday 12-18-13
- Presentation of Final Project

Final Project Requirements:
- Setting up Drawing Limits
- Cover Sheet w/ Location Map & Drawing Titles
- Drawing with Border & Title Block (Title Block to include Drawing Number & Job Number)
- Multiple Named Layers w/ Descriptions
- Multiple Linetypes
- Multiple Text Styles
- Tables / Schedules
- Viewports w/Drawing Titles & Scale
- Annotative Dimensions along Multiple Scaled Viewports
- Isometric Drawing or Detail Drawing
- Hatching
- External Reference Title Block and Main Drawing
- Produce a Named Color Dependent Plot Style
- Named Paperspace Tab
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