Course Syllabus

Course Title: SBC 354: Drawing for Design
Instructor: Greg Tarquinio

Earth & Space Sciences Building: Room ESS081
No. of Sessions: 32
Date Course Begins: 8-26-13
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),
- Lineweights (pg. 3-12) (Options/User Preferences)
- Ltscale
- Layers (pg. 3-8)
- Layers Property Box (pg. 3-10)
  Create (pg. 3-10)
  
  **Layer Description** – Click on Layer & Right Click Mouse

- Assign Colors (pg. 3-11) Set to Bylayer (Modify Panel)
- Transparency (pg. 3-14)
  Freeze / Thaw (pg. 3-9)
  On /Off (pg. 3-9)
  Lock / Unlock (pg. 3-9) (Lock Layer Fading)
  Delete (pg. 3-10)
  Not Plot (pg. 3-10)

- Match Properties (pg. 21-2)
- Make Object Layers Current
- Layer Previous
- Layer Isolate
- Layer Unisolate
- Layer Freeze
- Layer Off
- Turn All Layers On
- Thaw All Layers
- Change to Current Layer
- Copy Objects to New Layer
- Layer Walk
- Layer Merge
- Layer States

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**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

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

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**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 Papperspace 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 Boundaries (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 / Italics / 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
Align Leaders (pg. 19-3)  
Quick Dimensions (pg. 20-2)  
Edit Dimensions with Grips (pg. 17-4 & 20-5)  
**Ignore Hatching (pg 16-15)**  
Ordinate Dimensioning  
Overrides (pg.17-6)  
Text Angle  
Justifications - L/R/C  
  - Drawing Assignment: Drawing 20C (pg. 20-8) (Drawing #16)

**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
  - Mirrtext
  - 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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