Course Contents: Visualizations & Simulations

Details of the course:

a. Course Code
    ARCH 375
    (Pre-requisites: ARCH 150, ARCH 253)

b. Title
    Visualizations& Simulations

c. Credit Hours
    3(2-1)

d. Objectives

    (1)   Build on the existing skill-set acquired in previous courses

    (2)   Introduce students to various market software currently in use the world over

    (3)   Enable a basic to intermediate understanding of simulation methods

    (4)   Impart the ability to create realistic environmental effects and tweak settings

    (5)   Enhance portfolio and presentation techniques of the third-year Architecture Design (AD) students

    (6)   Prepare students for professional level exhibition content for thesis

    (7)   Enable students to select a designing platform that suits their needs

e.	**Outcomes**

(1)	Capabilities to better understand and communicate outcomes of AD studio projects

(2)	Ability to execute planned and sketched ideas in three dimensional models and scenarios

(3)	Ability to control real-world construction aspects in an online scenario

(4)	Ability to incorporate digital techniques

(5)	Greater understanding of time, environment and BIM simulation through real-time rendering.

f.	**Contents**

(1)	3D Modeling in platforms mentioned

(2)	Material/Texture mapping

(3)	Rendering

(4)	Animation and Video Editing

(5)	Building Analysis

(6)	The contact hours will be 3 hours per week.

g.	**Details of Lab Work, Workshops Practice**

(1)	Managing cross-platform 3D files and integration between software.

(2)	Project from AD studio to be taken into advanced rendering and analysis.

(3)	Visualizing of site with natural features and natural light.

(4)	Scene manipulation through time/day-night-dusk renders, adding lights.

(5)	Shadows by solar/global positioning (latitude and longitude) in Sketch Up/3DS **MAX**.

(6)	Working with image placement inside 3D scenes, HDRI images

(7)	Introduction to Real-Time rendering, using software like **Cry Engine 3, VSR** and **Arduino**

(8)	Introduction to **Rhino**, and its application, usage in parametric design in architecture, advantages of using **Rhino** than the other packages. Inclusion of **Grasshopper** visual language and **Kangaroo** simulation components.

(9)   Introduction to **Auto desk Vasari**, as well as other software for BIM analysis.

(10)   Introduction to Ecotect/GECO, building performance through thermal simulation, basics.

(11)   Employing **VRAY** for **Rhino**, **SketchUp**,**3DS MAX** realistic interior and exterior scenes

(12)   Application of surface finishes/materials and mapping onto 3D objects.

(13)   Basic to intermediate levels of animation: Setting keys, motion paths and movements. Moving objects along paths, frames, lights and camera settings.

(14)   Touching-up of rendered images in Adobe Photoshop, applying enhancing effects

(15)   Portfolio presentation and management.

(16)   Assignments: As per statutes

h.   **Marks Weightage distribution**

As per statutes

j.   Recommended Reading (including Textbooks and Reference books).

E- books:

(1)	Architectural Graphics	*Frank Ching*
(2)	Autodesk Revit Architecture 2010 in Practice	*Kogent Learning Solutions.Inc.*
(3)	Digital Drawing for Landscape Architecture	*Bradley Cantrell & Wes Michaels*
(4)	Enhancing CAD Drawings with Photoshop,	*Scott Onstott*
(5)	Google Sketch-up for Site Design,	*Daniel Tal*
(6)	Interactive Environments with Open-Source Software	*Wolfgang Hohl*
(7)	Introducing Revit® Architecture 2010	*Wiley Publishing Inc.*
(8)	Introduction to AutoCAD 2011, 2D & 3D Designs	*Alf Yarwood*

List of Recommended Software

1. Autodesk Auto CAD
2. Autodesk Revit: Accurender,Vasari
3. Google Sketch-Up 9: Sefaira Concept
4. Adobe Photoshop CS6
5. 3DS MAX DESIGN 2013
6. Rhino: *Grasshopper + Kangaroo + GECO*
7. Adobe Premier
8. Adobe After Effects

Miscellaneous: Software author groups:

a.   Autodesk

b.   Google(Trimble)

c.   Adobe

d.   Sefaira Concept (Sketch-Up)

e.   *Web content (useful sites)*

http://www.3dtotal.com/
http://cg.tutsplus.com/
http://www.creativecrash.com/
http://www.3dm3.com/tutorials/
http://www.3d-tutorials.com/
http://www.3dlessons.com/
http://sketchupdate.blogspot.com/
http://revittutorialsonline.com/
http://www.revitclinic.com/
http://www.rhino3d.com/resources/
http://www.rhino3dhelp.com/
https://www.tsplines.com/store/tstutorials.html