

**WEST VALLEY COLLEGE**  
**Course Outline**

**Department:** Architecture

**Course Number and Title:** ARCH 077 - GIS Applications to Architecture & Landscape Architecture

**Length of course in weeks:** 16

**Units:** 3

**Total Class Hours/Week:** 5

**Lecture Hours/Week:** 2

**Lab Hours/Week:** 3

**Grade Type:** Grade/Credit/No Credit

**Catalog Description:** This course is a study of Geographic Information Systems (GIS) software for application to relevant, natural and manmade environmental systems. It addresses both theory and application and provides the student with a dynamic analytical framework within which temporal and spatial data and information is gathered, integrated, interpreted, and manipulated. The students develop architectural or landscape architectural data base, to explore relevant environmental issues utilizing natural resources data such as habitats, vegetation, soils, topography, and geology. This course emphasizes a conceptual appreciation of the rapidly expanding field of GIS and offers an opportunity to apply some of those concepts to architecture, landscape architecture, and planning issues.

**Schedule Description:** This course is a study of Geographic Information Systems (GIS) software for application to relevant, natural and manmade environmental systems. Emphasis is on the conceptual appreciation of the rapidly expanding field of GIS and offers an opportunity to apply some of those concepts to architecture, landscape architecture, and planning issues.

**Recommended Preparation:**  
PKMGT 016A, Introduction to GIS

**Course Outcomes:** Student Learning Outcomes

**Outcome:** Analyze and develop solution(s) to a problem related to architecture or landscape architecture and create a map in ArcView GIS Software with data transferred from Pathfinder Office Software.

**Assessment:** Final project.

**Course Objectives:** Upon completion of this course the student should be able to:

1. Discuss and demonstrate the concepts and theory behind the use of GIS and GPS applied to architecture and landscape architecture.
2. Develop methods to solve problems unique to architecture and landscape architecture disciplines.
3. Create ArcView shapefiles/maps from architectural or landscape architectural files for spatial analysis purposes.
4. Create a map in ArcView GIS Software with data transferred from Pathfinder Office Software.
5. Collect data in the field utilizing Trimble Navigation GPS Units.
6. Import text, data base files, grid, and vector files into ArcView and convert them into shapefiles.
7. Run assigned queries on GIS coverages to display the desired text and graphic output.
8. Demonstrate the ability to select a unique architecture or landscape architecture topic of study, collect data, and find a result or hypothesis regarding that topic.
9. Define a problem related to architecture or landscape architecture; use a methodology for study, analysis, and development of solution(s).

**Assessment:** Students in this course will be graded base on the following four categories:

1. **Writing Assignments:** project description
2. **Problem Solving Demonstrations:** field work data collection reports
3. **Skill Demonstrations:** class & exam performances, field work data collection, projects, computer Lab performance
4. **Examinations:** completion of final project

**Repeatability:** 1 time

**Methods of Instruction:** Lecture & Lab

**Lecture Content:**

- |  |         |
|--|---------|
| 1. Section 1: Getting to know GIS:<br>Introducing GIS<br>Introducing ArcGIS Desktop                                      | 60.00 % |
| Section 2: Getting started with maps and data:<br>Exploring ArcMap<br>Exploring ArcCatalog                               |         |
| Section 3: Displaying data:<br>Symbolizing features and rasters<br>Classifying features and rasters<br>Labeling features |         |
| Section 4: Getting information about features:<br>Querying data  |         |

Joining and relating tables

Section 5: Analyzing feature relationships:

Selecting features by location

Preparing data for analysis

Analyzing spatial data

Projecting data in ArcMap

Section 6: Creating and editing data:

Building geodatabases

Creating features

Editing features and attributes

Geocoding addresses

Section 7: Presenting data:

Making maps from templates

Making maps for presentation

Section 8: Modeling

Creating models

- |   |         |
|---|---------|
| 2. Formerly glamorous                               | 40.00 % |
| Hudson River artist                                 |         |
| On the edge   |         |
| Celebrate the season                                |         |
| Subtle beauty                                       |         |
| A monument to the American West                     |         |
| Classic American                                    |         |
| Save our river                                      |         |
| Gold in the water                                   |         |
| Little League on the Tennessee River                |         |
| Who needs another method?                           |         |
| Saving the Salton Sea: A case study in GIS modeling |         |

**Lab Content:**

- |   |        |
|---|--------|
| 1. Exploring ArcMap;  | 4.00 % |
| Displaying map data;  |        |
| Navigating a map;   |        |
| Looking at feature attributes   |        |
| <br>  |        |
| 2. Exploring ArcCatalog; Browsing map data; Searching for map data; Adding data to ArcMap | 4.00 % |

3. Symbolizing features and rasters; Changing symbology; Symbolizing features by categorical attributes; Using styles and creating layer files; Symbolizing rasters 4.00 %
4. Classifying features and rasters; Classifying features by standard methods; Classifying features manually; Mapping density; Using graduated and chart symbols 4.00 %
5. Labeling features; Using dynamic labels; Setting rules for placing labels; Using interactive labels and creating annotation 4.00 %
6. Querying data; Identifying, selecting, finding, and hyperlinking features; Selecting features by attribute; Creating reports 4.00 %
7. Joining and relating tables; Joining tables; Relating tables 4.00 %
8. Selecting features by location; Using location queries; Combining attribute and location queries 4.00 %
9. Preparing data for analysis; Dissolving features; Creating graphs; Clipping layers; Exporting data 4.00 %
10. Analyzing spatial data; Buffering features; Overlaying data; Calculating attribute values 4.00 %
11. Projecting data in ArcMap; Projecting data on the fly; Defining a projection 4.00 %
12. Building geodatabases; Creating a personal geodatabase; Creating feature classes; Adding fields and domains 4.00 %
13. Creating features; Drawing features; Using feature construction tools 4.00 %
14. Editing features and attributes; Deleting and modifying features; Splitting and merging features; Editing feature attribute values 4.00 %
15. Geocoding addresses; Creating an address locator; Matching addresses; Rematching addresses 4.00 %
16. Making maps from templates; Opening a map template; Adding x,y data to a map; Drawing graphics on a map 4.00 %
17. Making maps for presentation; Laying out the page; Adding a title; Adding a north arrow, scale bar, and legend; Adding final touches and setting print options 4.00 %

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|--|---------|
| 18. Creating models; Starting a model; Building a model; Enhancing a model   | 4.00 %  |
| 19. Develop architectural or landscape architectural data base, to explore relevant environmental issues utilizing natural resources data such as habitats, vegetation, soils, topography and geology. | 28.00 % |

**Critical Thinking:** Analyze data collected from the GPS unit, then execute differential correction and transfer data to ArcView GIS and create a map representation of that data related to a specific architecture or landscape architecture project.

**College Level Required Reading, Writing, and other Outside-of-Class Assignments:** Over a 16 week presentation of the course, three hours per week are required for each unit of credit. Two hours of independent work done out of class are required for each hour of lecture. Outside of the regular class time the students in this class will be doing the following outside of class:

- **Study:** 1.00 additional hour
- **Problem solving activity or exercise:** 1.00 additional hour
- **Practice Skills:** 1.00 additional hour
- **Observation/Participation:** 1.00 additional hour

**Textbooks:**

1. Hanna, Karen C. GIS for Landscape Architects. ESRI Press, 1999. ISBN: 9781879102644
2. Ormsby Tim, Napoleon Eileen J., Burke Robert, Groessl Carolyn, Bowden, Laura S. Getting to Know ArcGIS Desktop, Updated for ArcGIS 9.3 . 2nd ed. ESRI Press, 2008. ISBN: 9781589482104