Lesson 1: What is Architecture?

Content Objectives

- The roles of the architect and the practice of architecture, as explained in Marcus Vitruvius Pollio's *Ten Books on Architecture*, the first known architectural treatise
- Some of Vitruvius' accomplishments as an engineer and architect
- The reason for keeping an architectural sketchbook and the potential for varied content in sketchbooks
- The definition of the *architect* from both ancient and modern times
- Key facts about Hammurabi and his influence on building codes through his code of laws
- Essential vocabulary associated with architecture and architectural drawing conventions, elements, and tools
- Some of the accomplishments of Leonardo da Vinci (1452-1519) and the varied content and styles found within his sketchbooks
- Some of the tools and materials used by ancient architects and some of the media used today
- The Seven Wonders of the Ancient World
- Seven types of architectural drawings

Skill Objectives

- Identify precedents in architecture by comparing ancient and modern structures
- Explain the importance of Leonardo da Vinci's Vitruvian Man sketch and then create and analyze the Vitruvian Man at full scale in order to illustrate human proportion and symmetry
- Identify and create several important types of architectural drawings
- Demonstrate annotation and paraphrasing skills through exercises such as reading about Hammurabi's Code and learning about the role of the architect in ancient times
- Apply basic concepts of scale and use common measurement systems
- Practice note taking while learning about the Seven Wonders of the Ancient World
- Research Leonardo da Vinci's sketchbooks
- Compare Internet and print sources and learn how to manipulate images
- Use the Golden Section in an architectural diagramming exercise in order to apply the mathematical foundations of classical proportions
- Create and use an architectural sketchbook
- Craft a "perfect paragraph" using the TCQC Short Answer Response format
- Observe local sites for the principles of strength, utility, and beauty

Lesson 2: How Do I Read a Building?

Content Objectives

- The meaning of the acronym S.P.E.A.R as it applies to architectural analysis: Structure, Program, Economics, Aesthetics, and Region
- The history and purpose of the Historic American Buildings Survey (HABS)
- The five classical orders of architecture through their specific features and cultural associations
- Key elements and an overview of the origins of classical architecture in ancient Egypt, Greece, and Rome
- The definition and application of essential vocabulary associated with classical architecture
- The differences between the codified 2-D and 3-D drawing types used in architectural representation

Skill Objectives

- Form investigative questions and extrapolate about the Pantheon by analyzing drawings and photographs and taking a virtual tour of the building
- Apply the acronym S.P.E.A.R. to the visual analysis of a building
- Demonstrate the ability to read an architectural drawing and appropriately identify architectural elements and drawing conventions
- Utilize Google Earth for virtual field trips to significant architectural sites
- Transform written information into a drawn representation
- Demonstrate annotation and paraphrasing skills through reading exercises
- Correctly label Doric, Ionic, and Corinthian columns
- Use the HABS database to study photographs, construction plans, or “as-built” drawings
- Observe, sketch, and identify key architectural details of an example of neoclassical architecture in their hometown/region
- Conduct additional research then compose a TCQC paragraph to describe their field of study

Lesson 3: S Is for Structure

Content Objectives

- The meaning of *structure*
- Basic components of structural systems (*arch, beam, cantilever, dome, keystone, lintel, pendentive, post, slab, truss, voussoir*) and examples of their uses
- The definition and application of essential vocabulary associated with the study of forces (*tension, compression, bending, torsion,* and *shear*)
- The difference between static and dynamic loads
- Some reasons why buildings might stay upright or fall down
- Geological conditions and natural forces found in different parts of the world that can impact architectural design, functionality, and structural integrity

Skill Objectives

- Identify technological advances in architecture and explain some of their causes and their importance
- Identify the structural elements in a series of drawings and photographs
- Identify the key innovative structural components in one of the Seven Wonders of the Ancient World
- Demonstrate comprehension of catastrophic and impact forces by designing and constructing egg encasement structures
- Demonstrate comprehension of forces by designing and constructing wood tower structures and clay domes
- Explain the phrase, “form follows function”

Lesson 4: P Is for Program

Content Objectives

- The definition of *program*
- The differences between *program* and *typology*
- The history of Brunelleschi's constructed perspectives and its impact on the perception and design of public space
- The origin and meaning of the key architectural phrase "form (ever) follows function"
- The essential vocabulary associated with the history and drawing conventions of perspective: *distance point*, *horizon line*, *picture plane*, *sight lines*, *standing point*, *vanishing point*
- The essential vocabulary associated with civic architecture, urban planning, and program
- Key buildings for fortification and defensive architecture: Great Wall of China from Shanhaiguan to Lop Nur, China (220-206 BCE), by Emperor Qin Shi Huang; heritage walled cities; and Edinburgh Castle in Edinburgh, Scotland (12th century)
- Examples of important seats of government: United States Capitol in Washington, D.C. (1793), by William Thornton, and Scottish Parliament Building at Holyrood, Scotland (1999-2004), by Enric Miralles
- Buildings significant in city organization and health, such as Columbian Exposition in Chicago, Illinois (1893)

Skill Objectives

- Demonstrate intermediate facility with Google Earth by measuring the perimeter of a selected city and creating polygons to identify changes in the urban fabric
- Construct the basic framework of a sketched perspective from life
- Create graphic organizers as a note-taking technique and design strategy
- Draw program diagrams
- Explain different types of government including: *anarchy*, *autocracy*, *democracy*, *dictatorship*, *feudalism*, *monarchy*, *oligarchy*, and *republic*
- Describe how to conduct a site visit and perform on-site sketching, using rules for safety and etiquette

Lesson 5: E Is for Economics

Content Objectives

- The financial components of design and engineering fees, materials, labor, and maintenance that determine the cost of a building
- The definition of *capital* in economic terms and five types of capital
- Gridded and radial city plans
- Vitruvius's philosophies on urban design
- Some modern philosophies and principles in urban planning
- The definition and application of essential vocabulary associated with *materiality* and *economics*

Skill Objectives

- Give examples of personal capital
- Explain *Second City Syndrome* and how the desire to build bigger and better can cause both positive and negative effects to the built environment
- Identify the significance of cities such as Chaux, France, or Seaside, Florida, and how they serve as precedents for future cities
- List some benefits of digital modeling and demonstrate a basic level of facility with SketchUp:
- Create basic 3-D shapes
- Download and manipulate a 3D Warehouse model of a public educational institution
- Trace a 2-D image in order to create a 3-D model

Lesson 6: A is for Aesthetics

Content Objectives

- The definition of *aesthetics*
- Examples of some ways various cultures commemorate people, places, and events through memorials and monuments
- The role of a landscape architect
- The differences between key architectural styles and how taste affects architectural development and design
- How topographical maps and site surveys are used in architecture and landscape architecture
- The definition and application of essential vocabulary associated with sculpture and landscape architecture

Skill Objectives

- Critique a regional monument or memorial by researching the creator and the selected audience
- Demonstrate a moderate level of facility with SketchUp and to show an understanding of three-dimensional geometry by creating an original reproduction of an existing monument from a select list
- Read a basic topography map in order to create orthogonally projected drawings and a pulled terrain model in SketchUp

Lesson 7: R Is for Region

Content Objectives

- Examples of cultural borrowing, such as language, traditions, and technology, and their importance in the development of selected societies
- The effects of cross-cultural imposition and exchange on the built environment
- The definition and application of essential vocabulary associated with *genius loci*
- The definition and application of essential vocabulary associated with *imperialism*, *colonization*, and *vernacular architecture*
- The difference between the terms *concrete* and *cement*
- Key buildings or sites such as Djoser's Step Pyramid in Saqqara, Egypt; Gardens of Versailles in Versailles, France; Stowe Landscape Gardens in Buckinghamshire, England; Villa d'Este in Tivoli, Italy; and The Alamo in San Antonio, Texas

Skill Objectives

- Conduct a regional assessment using the site-sight-cite system
- Demonstrate understanding of the S.P.E.A.R. acronym and apply it to assessments of key buildings
- Produce original research and present key findings
- Explain the concept *tabula rasa* and decide if a site can be considered a tabula rasa
- Create original plaster forms
- Determine the role of cultural and personal perspective in evaluation of regional designs

Lesson 8: Sustainable Practices

Content Objectives

- The environmental impact of regional activities, such as deforestation, urbanization, and industrialization
- The key components that define sustainable practices
- Rating systems used to assess the effectiveness of architectural projects
- Differences between the architectural practices of preservation, reconstruction, restoration, and rehabilitation
- The definition and application of essential vocabulary associated with sustainable design, environmentalism, and use of resources
- Vocabulary associated with energy, climate, and topography
- Key buildings: Chesapeake Bay Foundation (2001), Annapolis, Maryland, by SmithGroup; the Learning Barge (2009), Portsmouth, Virginia, by the University of Virginia; school buildings (1999-2011), Gando and Dano, Burkina Faso, by Diébédo Francis Kéré; Trinity Church (1876), Boston, Massachusetts, by H. H. Richardson; and the Reichstag (1894), Berlin, Germany, by Paul Wallot, and renovation and dome (1999), Sir Norman Foster

Skill Objectives

- Interpret through data and charts the amount of a building’s energy usage and to identify energy exchanges as embodied or expended
- Create sustainability diagrams
- Read a building's cultural and environmental impact through S.P.E.A.R.
- Research, present, and debate the validity and application of green architecture
- Collect data and read charts related to thermal comfort and climate
- Read systems diagrams and charts related to water flow, topography, and solar power
- Conduct a solar study
- Map a watershed
- Complete an independent design charrette for a small-scale building driven by sustainable principles

Lesson 9: Charrette, Part 1

Content Objectives

- Phases of architectural design: *project briefing*, *research*, *schematic design*, *design development*, and *design review*
- How to select and analyze a site
- Key vocabulary in this lesson: *charrette*, *parti*, and *RFP*
- Key buildings: White House in Washington, D.C., by James Hoban (1792-1830); Eiffel Tower in Paris, France, by Gustave Eiffel (1887-1889); London's K2 Telephone Box, by Giles Gilbert Scott (1923); Centre Pompidou in Paris, France, by Renzo Piano and Richard Rogers (1971-1977)

Skill Objectives

- Identify what an RFP entails and create an appropriate design response
- Use Google Earth to identify their selected site for the Green Café
- Complete a 3-D representation of a schematic design through design development in Google SketchUp
- Make program and circulation diagram sketches for their design
- Write a descriptive paragraph about their design process
- Use the Internet to research current architectural competitions for their future design endeavors
- Begin to develop the schematic design for a small sustainable (green) building

Lesson 10: Final Charrette

Content Objectives

- The components of the architectural review process and the differences between reviews in architecture school and architectural practice
- The concept of a *proun* and the basic tools for architectural model making
- The phases of architectural design that take an idea from paper to final built product: *schematic design*, *design development*, *construction documentation*, and *construction administration*
- Key vocabulary: *proun*, *RGB*, *CMYK*, *joinery*, and *lamination*
- Key elements of a successful presentation

Skill Objectives

- Effectively assess, respond to, and challenge the potential of the design prompt
- To create a body of original architectural drawings that demonstrate their design concept in plan, section, and elevation
- Create paper proun models of their design
- Complete a solar orientation and sun study of their competition design in SketchUp
- Diagram how natural elements like water and wind are integrated in their competition design
- Document their work through digital scanning and photography
- Demonstrate important organizational and time management skills
- Present their work, visually and verbally, in a cohesive and concise matter to an architectural jury