Course: Architectural Design **Unit #3: Planning and Design**	**Year of Implementation: 2019-2020**

Curriculum Team Members: Jason Pitner jpitner@lrhsd.org, Carl Kralik ckralik@lrhsd.org, Stefani Kirk skirk@lrhsd.org

Stage One - Desired Results

Link(s) to New Jersey Student Learning Standards for this course:
https://www.state.nj.us/education/cccs/2014/career/CareerReadyPractices.pdf

https://www.state.nj.us/education/aps/cccs/career/

Unit Standards:
8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
C. Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others
D. Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
E: Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.
F: Critical thinking, problem solving, and decision making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
A. The Nature of Technology: Creativity and Innovation Technology systems impact every aspect of the world in which we live
B. Technology and Society: Knowledge and understanding of human, cultural and societal values are fundamental when designing technological systems and products in the global society.
C. Design: The design process is a systematic approach to solving problems.

D. Abilities for a Technological World: The designed world is the product of a design process that provides the means to convert resources into products and systems.

9.2 Career Awareness, Exploration, and Preparation
9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.
9.2.8.B.1 Research careers within the 16 Career Clusters® and determine attributes of career success.
9.2.8.B.6 Demonstrate understanding of the necessary preparation and legal requirements to enter the workforce.
9.2.12.C.1 Review career goals and determine steps necessary for attainment.

9.3.AR Visual Arts (AR-VIS)
9.3.12.AR-VIS.1 Describe the history and evolution of the visual arts and its role in and impact on society.
9.3.12.AR-VIS.2 Analyze how the application of visual arts elements and principles of design communicate and express ideas.
9.3.12.AR-VIS.3 Analyze and create two and three-dimensional visual art forms using various media.

9.3.ST Engineering & Technology Career Pathway (ST-ET)
9.3.ST-ET.1 Use STEM concepts and processes to solve problems involving design and/or production.
9.3.ST-ET.2 Display and communicate STEM information.
9.3.ST-ET.3 Apply processes and concepts for the use of technological tools in STEM.
9.3.ST-ET.4 Apply the elements of the design process.
9.3.ST-ET.5 Apply the knowledge learned in STEM to solve problems.
9.3.ST-ET.6 Apply the knowledge learned in the study of STEM to provide solutions to human and societal problems in an ethical and legal manner.

Career Ready Practices:
CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP6. Demonstrate creativity and innovation.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP9. Model integrity, ethical leadership and effective management.
CRP10. Plan education and career paths aligned to personal goals.
CRP11. Use technology to enhance productivity.

<table>
<tr><td colspan="2">Transfer Goal(s): Students will be able to independently use their learning to design, layout and model residential house plans.</td></tr>
<tr><td><u>Enduring Understandings</u>
Students will understand that. . .
EU 1
interior planning with intent and purpose affects the livability and function of a house.

EU 2
each drawing in a set of architectural plans communicates a specific component of home design.

EU3
architects create various types of appearance models to share and communicate their designs.</td><td><u>Essential Questions</u>

EU 1
● What rooms should be grouped together in a home and why?
● How could you categorize areas of a home?
● Why are areas of a home laid out in a certain way?
● How does traffic flow affect room layout?
● What is the difference between form and function?

EU 2
● What types of plans are necessary to build a house?
● Is there a plan that has to be drawn first?
● Why are specific plans needed?

EU3
● What are the benefits of a computer generated 3D model?
● What are the effects of tool and material selection?
● How can availability of tools and materials affect model design?</td></tr>
<tr><td><u>Knowledge</u>
Students will know. . .
EU 1
● the names, purpose and essential features of each of the three main areas of a house.
● common sizes and spacing of interior features
● there is a relationship between form and function.
● what traffic flow and traffic patterns consist of.
● the effects of traffic flow on room layout.</td><td><u>Skills</u>
Students will be able to. . .
EU 1
● design a floor plan utilizing the three main areas of a house.
● create a traffic pattern diagram for their floor plan.
● utilize architectural symbols in their floor plan drawings.
● analyze a given plan for its intent.</td></tr>
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● the architectural symbols common to floor plans. EU 2 ● the different types of architectural plans. ● elevations and its features. ● the purpose of each of the components of architectural plans. ● the steps needed to construct a plan. EU 3 ● various appearance modeling techniques such as Revit Models, 3D renderings, and physical models. ● how to pick out the appropriate materials for a model.	EU 2 ● describe the purpose of each component of architectural plans. ● explain the steps needed to construct a plan. ● use CAD to create a floor plan drawing. ● utilize CAD skills to create electrical, elevation and plot plans. ● construct an architectural plan. EU 3 ● use Revit to create their floor plans. ● use a 3D printer to print their design. ● demonstrate proper tool usage when making models. ● demonstrate proper material selection for model making. ● use modeling skills to create their model.

Stage Two - Assessment

Other Evidence:

- Quizzes/Tests on:
  - Interior planning, symbols, room layouts.
  - Revit CAD commands and functions.
  - Drawing types and details.
- Observation of the student during the learning activities.
- Self-Assessment by student of their learning activities.

Stage Three - Instruction

Learning Plan: **Suggested Learning Activities to Include Differentiated Instruction and Interdisciplinary Connections: Each learning activity listed must be accompanied by a learning goal of A= Acquiring basic knowledge and skills, M= Making meaning and/or a T= Transfer.**

- Discuss the importance of layout and traffic flow in a floor plan. (**A, EU1)**
- Discuss the components of the 3 main areas of a house. (**A, EU1**)
- Identify traffic patterns from existing floor plans. (**M, EU1)**
- Analyze a given floor plan for spatial relationships of furnishings and fixtures. (**M, EU1)**
- Redesign an existing area of a home. (**M,T, EU1, EU2)**
- Create a floor plan of an existing home. (**M, EU2)**
- For a given plan (with existing mistakes), students must discover and explain existing problems with the plan. **(M, EU2)**
- Create an elevation drawing from a given floor plan. **(M, EU2)**
- Sketch features of a plot plan. **(M, EU2)**
- Create an electrical drawing from a given plan. **(M, EU2)**
- Discussion of material selection for model making **(A, EU2)**
- Safety practices for model making **(A, EU2)**
- Pick and analyze appropriate materials for a framed model. **(M, T, EU2)**
- Plan and design a treehouse. **(M, T, EU1, EU2, EU3)**
- Plan and design a dream home. **(M, T, EU1, EU2, EU3)**
- Plan and design a tiny house. **(M, T, EU1, EU2, EU3)**