Pequannock Township School District Curriculum Syllabus

Pequannock Township School District

Computer Aided Design Curriculum

Course Description:

Computer Aided Design (CAD) will introduce students to the basics of architectural design using industry standard software. Students will learn to create and design objects in two-dimensional spaces. Topics covered will include drafting, proportioning systems such as the golden section and the Fibonacci sequence, the classical orders of architecture, and various systems of architecture.

Course Standards:

Computer Aided Design is a course that will provide Pequannock students with an introduction to the field of architecture. Students will be engaged in a highly creative way with the design process from start to finish. Essential skills for the 21st century such as creativity, innovation, critical thinking, problem solving, communication and collaboration and information literacy will be emphasized throughout.

This course is aligned directly with NJCCS #8.1 on Educational Technology which reads "All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively to create and communicate knowledge." In addition, NJCCS #8.2 regarding Technology Education, Engineering and Design is also aligned and states "All students will develop an understanding of the nature and impact of technology, engineering, technological design and the designed world as they relate to the individual, global society, and the environment. The individual strands of these standards are outlined below.

Scope and Sequence

Unit 1: Introduction to Architectural Design and Modification

This unit will engage and excite students about the many possibilities of architectural design. The unit will introduce students to the CAD user interface and development environment.

8.1.12.A
8.1.12.B
8.2.12.D.3
8.2.12.E.3
9.3.ST-SM.2
CRP6
CRP11

Unit 2: Introduction to Architectural Design and Modification: Basic and Advanced Drawings

Students will demonstrate an understanding of the various tools in the Graphical User Interface. Students will demonstrate an understanding of the fundamentals of architectural design.

8.1.12.A
8.1.12.B
8.1.12.C
8.1.12.C.5
8.2.12.D.3
8.1.12.E
8.1.12.F
9.3.ST.1
9.3.ST.6
9.3.ST-ET.1
9.3.ST-ET.3
9.3.ST-SM.2

Unit 3: Classical Orders: Drawing of Columns

This unit will introduce students to the classical orders of architecture. Students will gain a better sense of how architectural design and ideas have evolved over time and how they continue to influence us today.

It is important for students of the 21st century to have a sense of how art and architecture have helped to define the culture of western civilization and likewise, how the east has developed a distinct expression of art and architecture over time. Learning about the classical forms students will help students to further appreciate and recognize the richness of architectural design in the world around them.

8.1.12.A.1
8.1.12.B
8.2.12.A.1
8.2.12.B.1
8.2.12.C.3

8.2.12.D.1
9.3.ST.1
9.3.ST.6
9.3.ST-ET.6
9.3.ST-SM.2
CRP4
CRP8
CRP11
CRP12

Unit 4: Classical Orders: Two Dimensional Layouts

This unit will introduce students to the classical orders of architecture. Students will gain a better sense of how architectural design and ideas have evolved over time and how they continue to influence us today. It is important for students of the 21st century to have a sense of how art and architecture have helped to define the culture of western civilization and likewise, how the east has developed a distinct expression of art and architecture over time. Learning about the classical forms students will help students to further appreciate and recognize the richness of architectural design in the world around them.

8.1.12.A.1
8.1.12.B
8.2.12.A.1
8.2.12.B.1
8.2.12.C.3
8.2.12.D.1
9.3.ST.1
9.3.ST.6
9.3.ST-ET.6
9.3.ST-SM.2
CRP4
CRP8
CRP11
CRP12

Unit 5: Introduction to 3D: Drawing Solids and Control Transformations

This unit will introduce students to the world of 3-dimensional architecture. Students will learn about different types of 3D models and how to create them. Having established a level of comfort in 2 dimensional design and the CAD toolset, students will now begin to extend these concepts to 3 dimensional spaces. This is a natural progression and students will have a good basis upon which to build their 3 dimensional architectural abstract thinking and vision.

8.2.12.A.1
8.2.12.B.1
8.1.12.A
8.1.12.B
8.1.12.C
8.1.12.E

8.2.12.C.3
8.2.12.D.1
9.3.ST.1
9.3.ST.6
9.3.ST-ET.1
9.3.ST-ET.2
9.3.ST-ET.4

Assessments

Evaluation of student achievement in this course will be based on the following: NJCCS: http://www.state.nj.us/education/cccs/
Rubrics are developed for Project Based Assignments

Curriculum Resources

Anchor Programs/Teacher Materials

Student-accessible PC's with sufficient processing power and memory to handle the Autodesk Design Academy software including CAD.

AutoDesk AutoCAD (Most Current Version)
SmartBoard, 3D Printer
Internet Explorer / Various Internet Resources
NJSLS: http://www.state.nj.us/education/cccs/
Safety information: Architectural Drafting and Design – Delmar:
https://www.osha.gov/
http://curriculum.autodesk.com/student/public/index/index

Home and School Connection

The following are suggestions and/or resources that will help parents support their children:

BASIC TECHNICAL DRAWING INSTRUCTOR RESOURCE GUIDE, McGraw-Hill Education, 978-0-07-845750-0

Autodesk Digital STEAM Workshop,
http://curriculum.autodesk.com/student/public/index/index

http://users.encs.concordia.ca/~nrskumar/Index_files/Mech390/Lecture/Lecture%201.pdf