

# Unit 07: Commercial Interior Design

Content Area: **Applied Technology**

Course(s):

Time Period: **Marking Period 3**

Length: **3 weeks**

Status: **Published**

## Summary

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### Introduction

Students will gain and develop knowledge and understandings related to interior design. Students will develop previously and newly learned CAD skills to employ this program as a tool to communicate a design for an interior commercial space: a restaurant. The site will be within their strip mall.

Revision Date: July 2021

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| CS.9-12.8.2.12.EC.1  | Analyze controversial technological issues and determine the degree to which individuals, businesses, and governments have an ethical role in decisions that are made.   |
| CS.9-12.8.2.12.EC.2  | Assess the positive and negative impacts of emerging technologies on developing countries and evaluate how individuals, non-profit organizations, and governments have responded.  |
| CS.9-12.8.2.12.EC.3  | Synthesize data, analyze trends, and draw conclusions regarding the effect of a technology on the individual, culture, society, and environment and share this information with the appropriate audience.  |
| CS.9-12.8.2.12.ED.1  | Use research to design and create a product or system that addresses a problem and make modifications based on input from potential consumers.   |
| CS.9-12.8.2.12.ED.2  | Create scaled engineering drawings for a new product or system and make modification to increase optimization based on feedback.   |
| CS.9-12.8.2.12.ED.3  | Evaluate several models of the same type of product and make recommendations for a new design based on a cost benefit analysis.  |
| CS.9-12.8.2.12.ETW.4 | Research historical tensions between environmental and economic considerations as driven by human needs and wants in the development of a technological product and present the competing viewpoints.  |
| CS.9-12.EC           | Ethics & Culture   |
| CS.9-12.ED           | Engineering Design   |
| LA.RH.11-12          | Reading History  |
| LA.RH.11-12.1        | Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.), to support analysis of primary and secondary sources, connecting insights gained from specific details to develop an understanding of the text as a whole. |
| LA.RH.11-12.2        | Determine the theme, central ideas, information and/or perspective(s) presented in a primary or secondary source; provide an accurate summary of how key events, ideas and/or author's perspective(s) develop over the course of the text.                       |
| LA.RH.11-12.3        | Evaluate various perspectives for actions or events; determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain.  |
| LA.WHST.11-12        | Writing History, Science and Technical Subjects  |
| LA.WHST.11-12.1      | Write arguments focused on discipline-specific content.  |
| MA.A-APR             | Arithmetic with Polynomials and Rational Expressions   |

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| MA.A-APR.A      | Perform arithmetic operations on polynomials   |
| MA.A-APR.A.1    | Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.   |
| MA.A-SSE        | Seeing Structure in Expressions  |
| MA.A-SSE.A      | Interpret the structure of expressions   |
| MA.A-SSE.A.1    | Interpret expressions that represent a quantity in terms of its context.   |
| MA.A-SSE.A.1a   | Interpret parts of an expression, such as terms, factors, and coefficients.  |
| CRP.K-12.CRP1   | Act as a responsible and contributing citizen and employee.  |
| CRP.K-12.CRP1.1 | Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.                    |
| CRP.K-12.CRP2   | Apply appropriate academic and technical skills.   |
| CRP.K-12.CRP2.1 | Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.  |
| CRP.K-12.CRP4   | Communicate clearly and effectively and with reason.   |
| CRP.K-12.CRP4.1 | Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome. |
| CRP.K-12.CRP6   | Demonstrate creativity and innovation.   |
| CRP.K-12.CRP6.1 | Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.   |
| CRP.K-12.CRP7   | Employ valid and reliable research strategies.   |
| CRP.K-12.CRP7.1 | Career-ready individuals are discerning in accepting and using new information to make decisions, change practices or inform strategies. They use reliable research process to search for new information. They evaluate the validity of sources when considering the use and adoption of external information or practices in their workplace situation.  |
| CRP.K-12.CRP8   | Utilize critical thinking to make sense of problems and persevere in solving them.   |
| CRP.K-12.CRP8.1 | Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they   |

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|                   | follow through to ensure the problem is solved, whether through their own actions or the actions of others.  |
| CRP.K-12.CRP11    | Use technology to enhance productivity.  |
| CRP.K-12.CRP11.1  | Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks. |
| SCI.HS.ETS1.A     | Delimiting Engineering Problems  |
| SCI.HS-ESS3       | Earth and Human Activity   |
| SCI.HS-ESS3-4     | Evaluate or refine a technological solution that reduces impacts of human activities on climate change and other natural systems.  |
| SCI.HS-ETS1-2     | Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.   |
| SCI.HS-ETS1       | Engineering Design   |
| SCI.HS-ETS1-4     | Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.   |
| SCI.HS-ETS1-1     | Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.   |
| SCI.HS-ETS1       | Engineering Design   |
| WRK.9.2.12.CAP    | Career Awareness and Planning  |
| WRK.9.2.12.CAP.4  | Evaluate different careers and develop various plans (e.g., costs of public, private, training schools) and timetables for achieving them, including educational/training requirements, costs, loans, and debt repayment.  |
| WRK.9.2.12.CAP.5  | Assess and modify a personal plan to support current interests and post-secondary plans.   |
| WRK.9.2.12.CAP.6  | Identify transferable skills in career choices and design alternative career plans based on those skills.  |
| WRK.9.2.12.CAP.7  | Use online resources to examine licensing, certification, and credentialing requirements at the local, state, and national levels to maintain compliance with industry requirements in areas of career interest.   |
| WRK.9.2.12.CAP.8  | Determine job entrance criteria (e.g., education credentials, math/writing/reading comprehension tests, drug tests) used by employers in various industry sectors.   |
| WRK.9.2.12.CAP.13 | Analyze how the economic, social, and political conditions of a time period can affect the labor market.   |
| TECH.8.1.12       | 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.   |
| TECH.8.1.12.A     | Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.   |
| TECH.8.1.12.A.1   | Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.  |
| TECH.8.1.12.A.2   | Produce and edit a multi-page digital document for a commercial or professional audience and present it to peers and/or professionals in that related area for review.   |
| TECH.8.1.12.A.CS1 | Understand and use technology systems.   |
| TECH.8.1.12.A.CS2 | Select and use applications effectively and productively.  |
| TECH.8.1.12.B     | Creativity and Innovation: Students demonstrate creative thinking, construct knowledge   |

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|                   | and develop innovative products and process using technology.   |
| TECH.8.1.12.B.2   | Apply previous content knowledge by creating and piloting a digital learning game or tutorial.  |
| TECH.8.1.12.B.CS1 | Apply existing knowledge to generate new ideas, products, or processes.   |
| TECH.8.1.12.B.CS2 | Create original works as a means of personal or group expression.   |
| TECH.8.1.12.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.   |
| TECH.8.1.12.C.1   | Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.   |
| TECH.8.1.12.C.CS1 | Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.   |
| TECH.8.1.12.D     | Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.  |
| TECH.8.1.12.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.  |
| TECH.8.1.12.F.CS1 | Identify and define authentic problems and significant questions for investigation.   |
| TECH.8.2.12       | 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. |
| TECH.8.2.12.A     | The Nature of Technology: Creativity and Innovation: Technology systems impact every aspect of the world in which we live.  |
| TECH.8.2.12.A.CS1 | The characteristics and scope of technology.  |
| TECH.8.2.12.B.4   | Investigate a technology used in a given period of history, e.g., stone age, industrial revolution or information age, and identify their impact and how they may have changed to meet human needs and wants.   |
| TECH.8.2.12.B.5   | Research the historical tensions between environmental and economic considerations as driven by human needs and wants in the development of a technological product, and present the competing viewpoints to peers for review.  |
| TECH.8.2.12.B.CS4 | The influence of technology on history.   |
| TECH.8.2.12.C     | Design: The design process is a systematic approach to solving problems.  |
| TECH.8.2.12.C.5   | Create scaled engineering drawings of products both manually and digitally with materials and measurements labeled.   |
| TECH.8.2.12.C.CS1 | The attributes of design.   |
| TECH.8.2.12.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.  |
| TECH.8.2.12.D.1   | Design and create a prototype to solve a real world problem using a design process, identify constraints addressed during the creation of the prototype, identify trade-offs made, and present the solution for peer review.  |
| TECH.8.2.12.D.3   | Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.   |
| TECH.8.2.12.D.5   | Explain how material processing impacts the quality of engineered and fabricated products.  |

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| TECH.8.2.12.D.CS1 | Apply the design process.   |
| TECH.8.2.12.D.CS2 | Use and maintain technological products and systems.  |
| TECH.8.2.12.D.CS3 | Assess the impact of products and systems.  |
| TECH.9.4.12.CI    | Creativity and Innovation   |
| TECH.9.4.12.CT    | Critical Thinking and Problem-solving   |
| TECH.9.4.12.TL    | Technology Literacy   |
|                   | Key Ideas and Details   |
|                   | Career planning requires purposeful planning based on research, self-knowledge, and informed choices.   |
|                   | Constructing Explanations and Designing Solutions   |
|                   | Engineering design evaluation, a process for determining how well a solution meets requirements, involves systematic comparisons between requirements, specifications, and constraints.   |
|                   | Asking Questions and Defining Problems  |
|                   | The ability to ethically integrate new technologies requires deciding whether to introduce a technology, taking into consideration local resources and the role of culture in acceptance. Consequences of technological use may be different for different groups of people and may change over time. Since technological decisions can have ethical implications, it is essential that individuals analyze issues by gathering evidence from multiple perspectives and conceiving of alternative possibilities before proposing solutions. |
|                   | Engineering design is a complex process in which creativity, content knowledge, research, and analysis are used to address local and global problems. Decisions on trade-offs involve systematic comparisons of all costs and benefits, and final steps that may involve redesigning for optimization.  |
|                   | Text Types and Purposes   |

## **Essential Questions/Enduring Understandings**

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### **Essential Questions:**

How do we use CAD to communicate interior designs?

How do we employ the design loop to solve problems?

How is this design similar and different from other design problems?

How do we communicate engineering solutions to technological problems with CAD?

### **Enduring Understandings:**

Interior designers are responsible for planning most large commercial interiors.

Interior design requires synthesis of aesthetic and functional requirements

Interior designs must meet code requirements.

## **Objectives**

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### **Students will know:**

What interior designers do, and a typical career path to become one.

Life safety, including means of egress, is a concern of interior design.

That public places need to be ADA compliant.

That materials in public places need to meet special fire requirements.

That the design of interior spaces is detail oriented, often consisting of specific products, systems, and finishes.

Interior designers often layout offices using systems.

Interior design requires making aesthetic choices.

Interior design is concerned with ergonomics and designing for humans.

Solutions to interior design problems can be accomplished with the use of the design loop.

### **Students will be skilled at:**

Developing drawings for interiors that meet ergonomic and functional needs.

Developing drawings for interiors that meet safety needs.

Developing drawings of interiors that communicate vertical qualities in a designed space

## **Learning Plan**

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Preview the essential questions and connect to learning throughout the unit.

Guiding questions:

What is interior design, and how does it differ from the design of an office building?

What types of projects do interior designers do?

Describe the hallways in the school. What features do they have that relate to fire? What materials are present, and in what quantity?

What life safety concerns does an interior designer have?

What Americans with Disabilities Act concerns does an interior designer have?

What are the components in a restaurant?

What components in a restaurant are similar to cars in a parking lot, shelves in a library, or office cubicles?

What essential information do you need to know about a restaurant to solve this problem?

Students to modify a general program (design brief) for a restaurant located in their strip mall. Students will create a solution to the program by providing floor plans, and elevations. Students will provide details concerning colors, seating, finishes, and all materials. Students will provide details for ADA compliance, sprinklers, and means of egress.

Lectures & class discussion about drawing requirements and strategies to accomplish them.

Lecture on the color wheel.

Lecture & class discussion on how to define spaces.

Lecture on noteworthy and famous interiors, including restaurants, lobbies and offices.

Formative assessments will be conducted throughout the design process.

Summative assessment will be conducted by the student and teacher using a rubric specific to the design problem.

Unit test or quiz.

Writing prompt.

## **Assessment**

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### **Formative assessment:**

Teacher Feedback and Class Discussions throughout the design process.

### **Summative assessment:**

Answer the essential questions.

Demonstrate the ability to create an interior design that solves a problem.

Use technical drawings to communicate the systems, furniture, means of egress and design elements of a project.

Demonstrate the ability to use software and technical drawing conventions to communicate a design effectively.

Demonstrate understanding of vocabulary and the unit concepts with written quizzes and test

Design and create presentation drawings for a building that demonstrates understanding of means of egress, curtain wall and steel construction. Student will maintain a log to demonstrate how the design loop was used. The final drawings will be included in the student's digital portfolio of the city block project. Students will maintain a log to explain how the design evolved, including sources of information and criticism.

The final presentation will include a written description that describes the technical aspects of the proposal. The presentation will include a written description that describes the technical aspects of the proposal. The presentation will be included in an electronic portfolio. The presentation will be evaluated using teacher and student designed rubrics.

Write a response to one or more writing prompts. Possible prompts: "What are the concerns that must be

considered when designing a restaurant or office"

Compare and contrast the careers of interior designer and architect.

**Alternative Assessment:**

Model of Commercial Interior designed space

**Benchmark Assessment:**

Final Exam

**Materials**

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The CADD LAB-computers equipped with up-to-date AutoCAD and/or other design and drafting software, presentation software, productivity software, a scanner and printers/plotters.

Traditional drafting equipment and supplies-vellum, colored and graphite pencils, pen and ink, drawing boards, tape, scissors, t-squares, triangles etc.

Chip-board, X-acto knives and other model making supplies.

A computer with INTERNET based presentation software (i.e. Prezi and Google Slides) and Microsoft Powerpoint.

Smartboard for demonstrations by the teacher and presentations by students.

**Integrated Accommodation and Modifications Spec Ed, ELL, At-Risk, G&T, Career Education, 504's**

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See the linked document for Integrated Accommodation and Modifications, Special Education, English Language Learners, At-Risk, Gifted and Talented, Career Education and 504s.