Title 7: Education K-12
Part 151: Mississippi Secondary Curriculum Frameworks in Career and Technical Education, Architecture & Construction, Architecture and Drafting

2022 Architecture and Drafting

Program CIP: 15.1301—Drafting and Design Technology/Technician, General

Direct inquiries to:

Instructional Design Specialist
Research and Curriculum Unit
P.O. Drawer DX
Mississippi State, MS 39762
662.325.2510

Program Coordinator
Office of Career and Technical Education
Mississippi Department of Education
P.O. Box 771
Jackson, MS 39205
601.359.3974

Published by:

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Research and Curriculum Unit
Mississippi State University
Mississippi State, MS 39762

The Research and Curriculum Unit (RCU), located in Starkville, as part of Mississippi State University (MSU), was established to foster educational enhancements and innovations. In keeping with the land-grant mission of MSU, the RCU is dedicated to improving the quality of life for Mississippians. The RCU enhances intellectual and professional development of Mississippi students and educators while applying knowledge and educational research to the lives of the people of the state. The RCU works within the contexts of curriculum development and revision, research, assessment, professional development, and industrial training.

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Acknowledgments

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Dr. Carey M. Wright, state superintendent of education
Ms. Rosemary G. Aultman, Chair
Mr. Glen East, Vice-Chair
Dr. Wendi Barrett
Dr. Angela Bass
Dr. Karen J. Elam
Mr. Bill Jacobs
Dr. Ronnie McGehee
Mr. Matt Miller
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Ms. Micah Hill, student representative

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Standards

Standards and alignment crosswalks are referenced in the appendices. Depending on the curriculum, these crosswalks should identify alignment to the standards mentioned below, as well as possible related academic topics as required in the Subject Area Testing Program in Algebra I, Biology I, English II, and U.S. History from 1877, which could be integrated into the content of the units. Mississippi's CTE architecture and drafting curriculum is aligned to the following standards:

American Design Drafting Association
The American Design Drafting Association (ADDA) is an international nonprofit, professional membership and educational organization born in Bartlesville, Oklahoma in 1948. Its purpose is to provide members with information, education, training, and professional development.
adda.org

International Society for Technology in Education Standards (ISTE)
Reprinted with permission from *ISTE Standards for Students* (2016). All rights reserved. Permission does not constitute an endorsement by ISTE.
iste.org

College- and Career-Ready Standards
College- and career-readiness standards emphasize critical thinking, teamwork, and problem-solving skills. Students will learn the skills and abilities demanded by the workforce of today and the future. Mississippi adopted Mississippi College- and Career-Readiness Standards (MCCRS) to provide a consistent, clear understanding of what students are expected to learn and so teachers and parents know what they need to do to help them.
mdek12.org/oae/college-and-career-readiness-standards

Framework for 21st Century Learning
In defining 21st-century learning, the Partnership for 21st Century Skills has embraced key themes and skill areas that represent the essential knowledge for the 21st century: global awareness; financial, economic, business and entrepreneurial literacy; civic literacy; health literacy; environmental literacy; learning and innovation skills; information, media, and technology skills; and life and career skills. *21 Framework Definitions* (2019).
battelleforkids.org/networks/p21/frameworks-resources

Preface

Secondary CTE programs in Mississippi face many challenges resulting from sweeping educational reforms at the national and state levels. Schools and teachers are increasingly being held accountable for providing applied learning activities to every student in the classroom. This accountability is measured through increased requirements for mastery and attainment of competency as documented through both formative and summative assessments. This document provides information, tools, and solutions that will aid students, teachers, and schools in creating and implementing applied, interactive, and innovative lessons. Through best practices, alignment with national standards and certifications, community partnerships, and a hands-on, student-centered concept, educators will be able to truly engage students in meaningful and collaborative learning opportunities.

The courses in this document reflect the statutory requirements as found in Section 37-3-49, *Mississippi Code of 1972*, as amended (Section 37-3-46). In addition, this curriculum reflects guidelines imposed by federal and state mandates (Laws, 1988, Ch. 487, §14; Laws, 1991, Ch. 423, §1; Laws, 1992, Ch. 519, §4 eff. from and after July 1, 1992; Strengthening Career and Technical Education for the 21st Century Act, 2019 [Perkins V]; and Every Student Succeeds Act, 2015).

Mississippi Teacher Professional Resources

The following are resources for Mississippi teachers:

Curriculum, Assessment, Professional Learning

Program resources can be found at the RCU's website, rcu.msstate.edu.

Learning Management System: An Online Resource

Learning management system information can be found at the RCU's website, under Professional Learning.

Should you need additional instructions, call the RCU at 662.325.2510.

Executive Summary

Pathway Description
Architecture and drafting is a pathway in the architecture and construction career cluster. Study in this program allows students to produce workable drawings on the drawing board and with the computer. Upon successful completion of the program, students will be qualified for an entry-level drafting or related position or may pursue postsecondary education. Skills developed through the course of study assist students in meeting requirements for the ADDA and/or Autodesk Certified User—CAD certification. Students are also provided the opportunity to participate in career and technical student organizations.

College, Career, and Certifications
An industry-recognized certification is available through the American Design Drafting Association, the American Digital Design Association, and Autodesk Certified User – CAD. Ample opportunities exist for continuing education in both two- and four-year degree options, as well.

Grade Level and Class Size Recommendations
It is recommended that students enter this program as a ninth grader. Exceptions to this are a district-level decision based on class size, enrollment numbers, and student maturity. It is preferred that the student complete the program in consecutive years. If not, it is recommended the student complete the program in no more than three years. A maximum of 25 students is recommended for classroom-based courses, while a maximum of 15 students is recommended for lab-based courses.

Student Prerequisites
For students to experience success in the program, the following student prerequisites are suggested:

1. C or higher in English (the previous year)
2. C or higher in high school-level math (last course taken or the instructor can specify the level of math instruction needed)
3. Instructor approval and TABE reading score (eighth grade or higher)

or

1. TABE reading and math score (eighth grade or higher)
2. Instructor approval

or

1. Instructor approval

Assessment
The latest assessment blueprint for the curriculum can be found at rcu.msstate.edu/curriculum/curriculumdownload.

Applied Academic Credit
The latest academic credit information can be found at mdek12.org/ese/approved-course-for-the-secondary-schools.

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Teacher Licensure

The latest teacher licensure information can be found at mdek12.org/oel/apply-for-an-educator-license.

Professional Learning

If you have specific questions about the content of any of the training sessions provided, please contact the RCU at 662.325.2510.

Course Outlines

Option 1—Four 1-Carnegie-Unit Courses

This curriculum consists of four one-credit courses that should be completed in the following sequence:

1. **Concepts of Drafting—Course Code: 994302**
2. **Drafting and Design—Course Code: 994303**
3. **Architectural Drafting—Course Code: 994304**
4. **Architectural Drafting Application—Course Code: 994305**

Course Description: Concepts of Drafting
This course includes an introduction to the field as well as fundamentals of safety, math, geometric construction, orthographic projection, and computer-aided drafting (CAD) applications. This is a one-Carnegie-unit course.

Course Description: Drafting and Design
This course emphasizes an overview of safety and an in-depth study of the elements of drafting. It gives students real-world, hands-on practice in these areas. This one-Carnegie-unit course should only be taken after the student successfully passes Concepts of Drafting.

Course Description: Architectural Drafting
This course includes a study of mathematics used in drafting and techniques used in residential and commercial drafting. It also reinforces safety related to the drafting and design industry. This course should only be taken after the student successfully passes Drafting and Design.

Course Description: Architectural Drafting Application
This course is a continued study of residential drafting techniques. It includes a study of the uses of drafting and design in today's global marketplace. This course should only be taken after the student successfully passes Architectural Drafting.

Concepts of Drafting—Course Code: 994302

Unit	Unit Name	Hours
1	Orientation	8
2	Fundamentals of Student Organizations	7
3	Introduction to Drafting	25
4	Lettering	10
5	Geometric Construction	25
6	Computer-Aided Drafting (CAD)	30
7	Orthographic Projection	35
Total		**140**

Drafting and Design—Course Code: 994303

Unit	Unit Name	Hours
8	Dimensioning	21
9	Sectional Views	26
10	Auxiliary Views	21
11	Pictorial Drawings	26
12	Machine Drafting	46
Total		**140**

Architectural Drafting—Course Code: 994304

Unit	Unit Name	Hours
13	Orientation and Safety	6
14	Architectural Drafting Math	39
15	Residential Architectural Drafting I	95
Total		**140**

Architectural Drafting Application—Course Code: 994305

Unit	Unit Name	Hours
16	Residential Architectural Drafting II	90
17	Residential Architectural Drafting III	50
Total		**140**

Option 2—Two 2-Carnegie Unit Courses

This curriculum consists of two 2-credit courses that should be completed in the following sequence:

1. **Architectural Design and Drafting I—Course Code: 994300**
2. **Architectural Design and Drafting II—Course Code: 994301**

Course Description: Architectural Design and Drafting I
This course is the entry-level course of the secondary architecture and drafting program. Students will gain foundational competencies related to orientation, safety, leadership and personal development, drafting, and CAD skills.

Course Description: Architectural Design and Drafting II
This course is the upper-level course of the secondary architecture and drafting program. Students will gain foundational competencies related to safety, advanced leadership and personal development, architectural drafting, and CAD skills. The architectural drafting section includes floor plans, elevations, foundations, and sections. This course should only be taken after the student successfully passes Architectural Design and Drafting I.

Architectural Design and Drafting I—Course Code: 994300

Unit	Unit Name	Hours
1	Orientation	8
2	Fundamentals of Student Organizations	7
3	Introduction to Drafting	25
4	Lettering	10
5	Geometric Construction	25
6	Computer-Aided Drafting (CAD)	30
7	Orthographic Projection	35
8	Dimensioning	21
9	Sectional Views	26
10	Auxiliary Views	21
11	Pictorial Drawings	26
12	Machine Drafting	46
Total		**280**

Architectural Design and Drafting II—Course Code: 994301

Unit	Unit Name	Hours
13	Orientation and Safety	6
14	Architectural Drafting Math	39
15	Residential Architectural Drafting I	95
16	Residential Architectural Drafting II	90
17	Residential Architectural Drafting III	50
Total		**280**

Career Pathway Outlook

Overview

Architectural drafting is a method of documenting geometric dimensioning and characteristics, including shape, size, color, and surface finish. Many companies across the globe use drafters to record the thoughts of engineers and scientists in written language through the use of shape and alphabet association. Without drafters to document processes, construction and manufacturing would suffer in production as well as quality. Architectural design allows people of many varying cultures and languages to communicate without barriers in the creation of today's greatest accomplishments.

Needs of the Future Workforce

There will be a need for drafters in the future. Mississippi can expect to see a 10.5% increase in mechanical drafters and a 3.8% increase in survey technicians over the next eight to 10 years.

Table 1.1: Current and Projected Occupation Report

Description	Jobs, 2016	Projected Jobs, 2026	Change (Number)	Change (Percent)	Average Hourly Earnings, 2020
Architectural and Civil Drafters	450	450	0	0.0%	$23.42
Mechanical Drafters	190	210	20	10.5%	$25.56
Surveying and Mapping Technicians	530	550	20	3.8%	$19.15

Source: Mississippi Department of Employment Security; mdes.ms.gov (2020).

Perkins V Requirements and Academic Infusion

The architecture and drafting curriculum meets Perkins V requirements of introducing students to and preparing them for high-skill, high-wage occupations in drafting fields. It also offers students a program of study, including secondary, postsecondary, and institutions of higher learning courses, that will further prepare them for drafting careers. Additionally, this curriculum is integrated with academic college- and career-readiness standards. Lastly, it focuses on ongoing and meaningful professional development for teachers as well as relationships with industry.

Transition to Postsecondary Education

The latest articulation information for secondary to postsecondary can be found at the Mississippi Community College Board website, mccb.edu.

Best Practices

Innovative Instructional Technologies

Classrooms should be equipped with tools that will teach today's digital learners through applicable and modern practices. The architecture and drafting educator's goal should be to include teaching strategies that incorporate current technology. To make use of the latest online communication tools—wikis, blogs, podcasts, and social media platforms, for example—the classroom teacher is encouraged to use a learning management system that introduces students to education in an online environment and places more of the responsibility of learning on the student.

Differentiated Instruction

Students learn in a variety of ways, and numerous factors—students' backgrounds, emotional health, and circumstances, for example—create unique learners. By providing various teaching and assessment strategies, students with various learning preferences can have more opportunity to succeed.

CTE Student Organizations

Teachers should investigate opportunities to sponsor a student organization. There are several here in Mississippi that will foster the types of learning expected from the architecture and drafting curriculum. SkillsUSA and Technology Student Association (TSA) are examples of student organizations with many outlets for drafting. Student organizations provide participants and members with growth opportunities and competitive events. They also open the doors to the world of drafting careers and scholarship opportunities.

Cooperative Learning

Cooperative learning can help students understand topics when independent learning cannot. Therefore, you will see several opportunities in the architecture and drafting curriculum for group work. To function in today's workforce, students need to be able to work collaboratively with others and solve problems without excessive conflict. The architecture and drafting curriculum provides opportunities for students to work together and help each other complete complex tasks. There are many field experiences within the architecture and drafting curriculum that will allow and encourage collaboration with professionals currently in the architecture and drafting field.

Work-Based Learning

Work-based learning is an extension of understanding competencies taught in the architecture and drafting classroom. This curriculum is designed in a way that necessitates active involvement by the students in the community around them and the global environment. These real-world connections and applications link all types of students to knowledge, skills, and professional dispositions. Work-based learning should encompass ongoing and increasingly more complex involvement with local companies and drafting professionals. Thus, supervised collaboration and immersion into the drafting industry around the students are keys to students' success, knowledge, and skills development.

Professional Organizations

American Design Drafting Association (ADDA)
adda.org

Technology Student Association (TSA)
tsaweb.org

SkillsUSA
skillsusa.org

Using This Document

Competencies and Suggested Objectives
A competency represents a general concept or performance that students are expected to master as a requirement for satisfactorily completing a unit. Students will be expected to receive instruction on all competencies. The suggested objectives represent the enabling and supporting knowledge and performances that will indicate mastery of the competency at the course level.

Teacher Resources
Teacher resources for this curriculum may be found in multiple places. Many program areas have teacher resource documents that accompany the curriculum and can be downloaded from the same site as the curriculum. The teacher resource document contains references, lesson ideas, websites, teaching and assessment strategies, scenarios, skills to master, and other resources divided by unit. This document could be updated periodically by RCU staff. Please check the entire document, including the entries for each unit, regularly for new information. If you have something you would like to add or have a question about the document, call or email the RCU's instructional design specialist for your program. The teacher resource document can be downloaded at rcu.msstate.edu/curriculum/curriculumdownload.aspx. All teachers should request to be added to the Canvas Resource Guide for their course. This is where all resources will be housed in the future, if they are not already. To be added to the guide, send a Help Desk ticket to the RCU by emailing helpdesk@rcu.msstate.edu.

Perkins V Quality Indicators and Enrichment Material
Many of the units include an enrichment section at the end. If the architecture and drafting program is currently using the Mississippi Career Planning and Assessment System (MS-CPAS) as a measure of accountability, the enrichment section of material will not be tested. If this is the case, it is suggested to use the enrichment material when needed or desired by the teacher and if time allows in the class. This material will greatly enhance the learning experiences for students. If, however, the architecture and drafting program is using a national certification or other measure of accountability that aligns with Perkins V as a quality indicator, this material could very well be tested. It is the responsibility of the teacher to ensure all competencies for the selected assessment are covered throughout the year.

Unit 1: Orientation

Competencies and Suggested Objectives
1. Demonstrate understanding of local program requirements. DOK1 a. Observe local student handbook and classroom requirements.
2. Research career opportunities, earnings, and educational requirements in the architecture industry. DOK1 a. Describe earnings, educational requirements, career ladder, and organizations associated with the various fields of the architecture industry (i.e., residential, commercial, and industrial).

Note: This unit will be ongoing throughout the year. Time allotted for this unit will be distributed over the entire year.

Unit 2: Fundamentals of Student Organizations

Competencies and Suggested Objectives
1. Discuss the history, mission, and purpose of student organizations, including SkillsUSA and TSA. DOK1 a. Trace the history of the program area student organization. b. Identify the mission, purpose, and/or goals of the program area's student organization.
2. Explore the advantages of membership in a student organization. DOK1 a. Discuss the membership process for the program area's student organization. b. Explain the activities related to the local chapter and the state and national organizations.
3. Discuss the organization's brand resources. DOK1 a. Identify the motto, creed, and/or pledge and discuss their meanings. b. Recognize related brand resources. • Emblem • Colors • Official attire • Logos • Graphic standards
4. Describe the importance of effective communication skills. DOK1 a. Demonstrate verbal and nonverbal communication skills. b. Apply appropriate speaking and listening skills to class- and work-related situations.
5. Apply leadership skills to class- and work-related situations and 21st century skills. DOK2 a. Define leadership. b. Discuss the attributes of a leader. c. Identify the roles a leader can assume.
6. Utilize team-building skills in class- and work-related situations. DOK2 a. Define team building. b. Discuss the attributes of a team. c. Identify the roles included in a team.
7. Discuss the various competitions offered through the student organization(s). DOK1 a. Describe each of the competitions and the skills needed to accomplish the tasks. b. Perform the tasks needed to complete an assigned requirement for a competition.

Note: This unit will be ongoing throughout the year. Time allotted for this unit will be distributed over the entire year.

Unit 3: Introduction to Drafting

Competencies and Suggested Objectives
1. Explain the purpose of technical drawing and freehand technical sketches. DOK2 a. Identify appropriate techniques for technical drawing and freehand technical sketches.
2. Create freehand technical sketches. DOK2 a. Identify appropriate techniques for freehand sketches. b. Construct a freehand technical sketch. c. Recognize the alphabet of lines.
3. Identify and demonstrate drafting tools and media. DOK2 a. Identify drafting tools. b. Examine media and various sheet sizes. c. Interpret architecture and engineering scale units.
4. Demonstrate skills in mathematical concepts related to drafting technology. DOK2 a. Use mathematical concepts to solve problems of measurement. b. Perform addition and subtraction of fractions and decimals. (1/16, 1/8, 1/4, 1/2) c. Convert fractions to decimals and decimals to fractions. (1/16, 1/8, 1/4, 1/2)

Note: This unit will be ongoing throughout the year. Time allotted for this unit will be distributed over the entire year.

Unit 4: Lettering

Competencies and Suggested Objectives
1. Demonstrate the techniques of lettering and construct uppercase gothic letters and numerals. DOK2 a. Construct freehand letters and numerals in various script fonts. b. Apply measurements for layout of guidelines.

Unit 5: Geometric Construction

Competencies and Suggested Objectives
1. Define basic geometric shapes and terms. DOK2 a. Define geometric terms and identify shapes.
2. Construct various geometric shapes using constructional techniques on a drawing table.DOK2 a. Construct various geometric shapes using constructional techniques on a drawing table. • Bisect a line, arc, and angle. • Construct a perpendicular line from a point on a line. • Divide a line into equal parts. • Draw tangencies. • Construct various polygons. • Construct an octagon. • Construct a hexagon. • Construct a line parallel to a given line or plane.

Unit 6: Computer-Aided Drafting (CAD)

Competencies and Suggested Objectives
1. Use CAD hardware and software. DOK2 a. Recognize the various hardware components of a CAD system. • Define CAD hardware/software terms. • Demonstrate care and maintenance of computer software/hardware. • Start up/shut down CAD system. • Operate plotter/printer.
2. Create text using appropriate style and size on a CAD system. DOK2 a. Demonstrate inserting text using CAD. • Select text style. • Create various text sizes. • Utilize CAD text-edit commands. • Create borders and title blocks for various sheet sizes.
3. Create a basic CAD drawing. DOK3 a. Identify basic commands for CAD drawing. b. Discuss and apply absolute, relative, and polar coordinates. c. Construct a CAD drawing using endpoint, midpoint, and intersection object snaps correctly.

Unit 7: Orthographic Projection

Competencies and Suggested Objectives
1. Describe various aspects of orthographic projections and other drawing media. DOK2 a. Describe terms, views, line types, and the spacing of views used in orthographic projections. b. Describe and apply formulas for centering and spacing of views on the drawing media.
2. Construct principal views in orthographic projections. DOK3 a. Construct principal views in orthographic projections and apply calculations to determine missing measurements and angles when applicable.
3. Construct orthographic views using a CAD station. DOK3

Unit 8: Dimensioning

Competencies and Suggested Objectives
1. Apply general rules, line types, and notes for dimensioning per ANSI standards. DOK3 a. Identify line types used in dimensioning. b. Dimension objects with various geometric shapes. c. Apply size and location dimensions of an object.

Unit 9: Sectional Views

Competencies and Suggested Objectives
1. Demonstrate creating sectional views. DOK3 a. Describe and identify the types of sectional views. b. Construct full, half, revolved, aligned, removed, offset, and broken-out section views.
2. Construct a sectional view using CAD. DOK3 a. Identify CAD commands used to create sectional drawings.

Unit 10: Auxiliary Views

Competencies and Suggested Objectives
1. Demonstrate creating auxiliary views. DOK2 a. Describe and construct primary auxiliary views. b. Relate perpendicular and parallel between views.
2. Construct a primary auxiliary view using CAD. DOK2 a. Identify and use CAD commands used to create a primary auxiliary view.

Unit 11: Pictorial Drawings

Competencies and Suggested Objectives
1. Identify and describe the different types of pictorial drawings. DOK1 a. Describe the methods of constructing pictorial drawings.
2. Construct and analyze pictorial drawings. DOK3 a. Construct an isometric drawing. b. Identify the three isometric axes. c. Construct an oblique drawing. d. Distinguish between Cavalier (depth full scale) and Cabinet (depth half scale). e. Construct a perspective drawing.
3. Construct an isometric drawing on the CAD system. DOK3 a. Identify and use CAD commands to create an isometric drawing.

Unit 12: Machine Drafting

Competencies and Suggested Objectives
1. Identify terms and symbols associated with machining and manufacturing processes. DOK2
2. Identify thread forms and representations of threads and fasteners. DOK3 a. Describe uses of threads. b. Describe types of threads. c. Match thread terms with definitions. d. Illustrate the various thread representations. e. Calculate thread pitch and length of threads. f. Draw an internal and external thread form. g. Interpret thread notes. h. Create a detailed machine drawing illustrating threads. i. Describe methods of thread representation. j. Draw an internal and external thread form.
3. Produce an assembly drawing. DOK3 a. Produce a basic assembly drawing with fasteners.

Unit 13: Orientation and Safety

Competencies and Suggested Objectives
1. Review and demonstrate understanding of local program requirements. DOK1 a. Observe local student handbook and classroom requirements.
2. Review leadership skills and personal development opportunities provided to students by student organizations, including SkillsUSA and TSA. DOK1 a. Demonstrate effective team-building and leadership skills. b. Practice appropriate work ethics.
3. Review and research career opportunities, earnings, and educational requirements in the architecture industry. DOK1 a. Describe earnings, educational requirements, career ladder, and organizations associated with the various fields of the architecture industry (i.e., residential, commercial, and industrial).

Note: This unit will be ongoing throughout the year. Time allotted for this unit will be distributed over the entire year.

Enrichment
1. Discuss the International Building Code, the Americans with Disabilities Act, types of zoning, and other factors that influence how buildings (both residential and commercial) are designed and constructed.

Unit 14: Architectural Drafting Math

Competencies and Suggested Objectives
1. Calculate linear measurements. DOK2
2. Read and interpret the architect and engineering scale. DOK2 a. Read and interpret the architecture and engineering scale for architectural and mechanical applications.
3. Calculate residential square footage. DOK2 a. Calculate residential square footage for area, volume, and plan specification. b. Calculate net square feet, gross square feet, and BOMA calculations.
4. Calculate and apply spatial requirements for residential design. DOK2
5. Estimate residential cost based on specified cost per square foot. DOK3
6. Discuss industry material sizes (e.g., nominal size vs. actual size of wood members, linear feet, cubic yards, etc.). DOK1

Note: This unit will be ongoing throughout the year. Time allotted for this unit will be distributed over the entire year.

Unit 15: Residential Architectural Drafting I

Competencies and Suggested Objectives
1. Perform all necessary calculations, apply spatial and local code requirements, and estimate the cost of a residential floor plan design. DOK3
2. Produce sketches in planning the three main residential areas. DOK3 a. Describe requirements for the three main residential areas. b. Sketch rooms, including service, living, sleeping areas, and floor plan.
3. Produce an architecturally correct floor plan. DOK3 a. Identify architectural terms and symbols related to floor plans. b. Construct architectural letters. c. Draw and dimension a floor plan.

Unit 16: Residential Architectural Drafting II

Competencies and Suggested Objectives
1. Calculate all necessary measurements, interpreting the architecture and engineering scale, and apply those and local code requirements to exterior elevation and electrical plan designs. DOK3
2. Draw and note exterior elevations. DOK3 a. Identify architectural terms, symbols, and requirements related to elevations. b. Construct a front elevation. c. Construct side elevations. d. Construct a rear elevation.
3. Produce an electrical plan. DOK3 a. Describe terms, symbols, and requirements related to an electrical plan. b. Draw an electrical plan.

Unit 17: Residential Architectural Drafting III

Competencies and Suggested Objectives
1. Perform all necessary calculations, apply spatial and local code requirements, and estimate the cost of various residential designs, including those of an exterior wall section, foundation plan, plot/site plan, plumbing and HVAC plans. DOK3
2. Draw, dimension, and label an exterior wall section. DOK3 a. Identify building material terms, symbols, and requirements. b. Draw, dimension, and label a typical exterior wall section.
3. Produce an architecturally correct foundation plan. DOK3 a. Describe terms, symbols, and requirements related to foundation plans. b. Draw and dimension a foundation plan. c. Draw footing details.
4. Develop a residential plot/site plan. DOK3 a. Describe terms, symbols, and requirements related to a plot/site plan. b. Draw a plot/site plan.
5. Discuss plumbing and HVAC plans. DOK3 a. Describe terms, symbols, and requirements related to a plumbing and HVAC plan.

Student Competency Profile

Student's Name: _____

This record is intended to serve as a method of noting student achievement of the competencies in each unit. It can be duplicated for each student, and it can serve as a cumulative record of competencies achieved in the course.

In the blank before each competency, place the date on which the student mastered the competency.

Unit 1: Orientation		
	1.	Demonstrate understanding of local program requirements.
	2.	Research career opportunities, earnings, and educational requirements in the architecture industry.
Unit 2: Fundamentals of Student Organizations		
	1.	Discuss the history, mission, and purpose of student organizations, including SkillsUSA and TSA.
	2.	Explore the advantages of membership in a student organization.
	3.	Discuss the organization's brand resources.
	4.	Describe the importance of effective communication skills.
	5.	Apply leadership skills to class- and work-related situations and 21st century skills.
	6.	Utilize team-building skills in class- and work-related situations.
	7.	Discuss the various competitions offered through the student organization(s).
Unit 3: Introduction to Drafting		
	1.	Explain the purpose of technical drawing and freehand technical sketches.
	2.	Create freehand technical sketches.
	3.	Identify and demonstrate drafting tools and media.
	4.	Demonstrate skills in mathematical concepts related to drafting technology.
Unit 4: Lettering		
	1.	Demonstrate the techniques of lettering and construct uppercase gothic letters and numerals.
Unit 5: Geometric Construction		
	1.	Define basic geometric shapes and terms.
	2.	Construct various geometric shapes using constructional techniques on a drawing table.

Unit 6: Computer-Aided Drafting (CAD)		
	1.	Use CAD hardware and software.
	2.	Create text using appropriate style and size on a CAD system.
	3.	Create a basic CAD drawing.
Unit 7: Orthographic Projection		
	1.	Describe various aspects of orthographic projections and other drawing media.
	2.	Construct principal views in orthographic projections.
	3.	Construct orthographic views using a CAD station.
Unit 8: Dimensioning		
	1.	Apply general rules, line types, and notes for dimensioning per ANSI standards.
Unit 9: Sectional Views		
	1.	Demonstrate creating sectional views.
	2.	Construct a sectional view using CAD.
Unit 10: Auxiliary Views		
	1.	Demonstrate creating auxiliary views.
	2.	Construct a primary auxiliary view using CAD.
Unit 11: Pictorial Drawings		
	1.	Identify and describe the different types of pictorial drawings.
	2.	Construct and analyze pictorial drawings.
	3.	Construct an isometric drawing on the CAD system.
Unit 12: Machine Drafting		
	1.	Identify terms and symbols associated with machining and manufacturing processes.
	2.	Identify thread forms and representations of threads and fasteners.
	3.	Produce an assembly drawing.
Unit 13: Orientation and Safety		
	1.	Review and demonstrate understanding of local program requirements.
	2.	Review leadership skills and personal development opportunities provided to students by student organizations, including SkillsUSA and TSA.
	3.	Review and research career opportunities, earnings, and educational requirements in the architecture industry.

Unit 14: Architectural Drafting Math (Ongoing throughout the year)		
	1.	Calculate linear measurements.
	2.	Read and interpret the architect and engineering scale.
	3.	Calculate residential square footage.
	4.	Calculate and apply spatial requirements for residential design.
	5.	Estimate residential cost based on specified cost per square foot.
	6.	Discuss industry material sizes (e.g., nominal size vs. actual size of wood members, linear feet, cubic yards, etc.).
Unit 15: Residential Architectural Drafting I		
	1.	Perform all necessary calculations, apply spatial and local code requirements, and estimate the cost of a residential floor plan design
	2.	Produce sketches in planning the three main residential areas.
	3.	Produce an architecturally correct floor plan.
Unit 16: Residential Architectural Drafting II		
	1.	Calculate all necessary measurements, interpreting the architecture and engineering scale, and apply those and local code requirements to exterior elevation and electrical plan designs.
	2.	Draw and note exterior elevations.
	3.	Produce an electrical plan.
Unit 17: Residential Architectural Drafting III		
	1.	Perform all necessary calculations, apply spatial and local code requirements, and estimate the cost of various residential designs, including those of an exterior wall section, foundation plan, plot/site plan, plumbing and HVAC plans.
	2.	Draw, dimension, and label an exterior wall section.
	3.	Produce an architecturally correct foundation plan.
	4.	Develop a residential plot/site plan.
	5.	Discuss plumbing and HVAC plans.

Appendix A: Industry Standards—ADDA

ADDA International

	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Architectural Apprentice Drafter																		
PDC		X												X				
DEM				X			X											
ASO				X		X	X	X			X							
LLT				X	X		X	X	X		X	X						
MAG				X		X		X	X	X	X	X	X		X	X	X	X
APS								X			X	X						
LIT												X				X	X	X
INM				X		X	X	X	X		X							
DAN									X		X	X					X	X
FPL																		
HPE																	X	X
RPI																X		
ELE																X		
FFP																X		
FPL										X						X		
SSS																X		
BCG																X	X	X
SDW																X		
ESC															X			
DBM															X			
Mechanical Apprentice Drafter																		
ATI				X		X	X	X	X	X	X	X	X			X	X	X
DMR				X		X										X	X	X
SLG					X	X	X									X	X	X
DAN								X	X	X	X		X			X	X	X
OPI							X										X	X
GCD						X												
GDT									X				X					
MAG							X	X	X	X	X	X	X		X	X	X	X
DIN						X	X	X		X	X	X	X			X	X	X
PDC		X																
MVC																		
SEV																		
AUV																		
PIC																		
BWS												X						

Architectural Apprentice Drafter *

PDC Professional Drafting Practices in the Workplace – Communications
DEM Drafting Equipment – Media – Reproduction
ASO Architectural Sketching – Orthographic Projections & Sheets

LLT	Lines – Lettering – General Terminology
MAG	Mathematics and Geometry
APS	Architectural Products – Styles – History – Identification and Terminology
LIT	Building &Site Layout – Identifications and Terminology
INM	Drawing Identification – Architectural Numbering – Drawing Management
DAN	Dimensioning and Notations
FPL	Floor Plan Layout – Relationships – Identification and Terminology
HPE	HVAC – Plumbing – Electrical Plans – Identification and Terminology
RPI	Roof Plans – Identification and Terminology
ELE	Elevations- Identification and related Terminology
FFP	Framing – Framing Plans – Identification and Terminology
FPI	Foundation Plans – Identification and Terminology
SSS	Sections & Stairs and Steps Identification - Terminology
BCG	Building Codes – Regulations, Governing Bodies Organizations
SDW	Schedules – Doors – Windows – Finishes
ESC	Estimations – Specifications – Project Calculations
DBM	Definitions and Building Materials

Mechanical Apprentice Drafter *

ATI	Abbreviations – Terms – Identification
DMR	Drafting Equipment – Media – Reproduction
SLG	Shapes – Lettering – Geometric Symbology
DAN	Dimensioning and Notations
OPI	Orthographic Projections – Identification and Terminology
GCD	Geometric Construction and Descriptive Geometry
MVC	Multiview - Castings
SEV	Sectional Views
AUV	Auxiliary Views
PIC	Pictorials
BWS	Basic Welding – Symbols
GDT	Basic Tolerancing – GD&T
MAG	Basic Math– Drafting Math – Geometry
DIN	Drawing Implementation – Identification – Numbering – Drawing Management

Appendix B: Industry Standards—AutoCAD

Autodesk Certified User: AutoCAD

	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Standard																		
ABD					X	X	X	X	X	X	X	X		X	X	X	X	X
DRO					X	X	X	X	X	X	X	X		X	X	X	X	X
DWA					X	X	X	X	X	X	X	X		X	X	X	X	X
MOO					X	X	X	X	X	X	X	X		X	X	X	X	X
UAD					X	X	X	X	X	X	X	X		X	X	X	X	X
ORO					X	X	X	X	X	X	X	X		X	X	X	X	X
REC					X	X	X	X	X	X	X	X		X	X	X	X	X
AND					X	X	X	X	X	X	X	X		X	X	X	X	X
LAP					X	X	X	X	X	X	X	X		X	X	X	X	X
ABDS					X	X	X	X	X	X	X	X		X	X	X	X	X

ABD Apply Basic Drawing Skills
DRO Draw Objects
DWA Draw with Accuracy
MOO Modify Objects
UAD Use Additional Drawing Techniques
ORO Organize Objects
REC Reuse Existing Content
AND Annotate Drawings
LAP Layouts and Printing
ABDS Apply Basic Drawing Skills