



Prepares Students for College and Careers

▲ **Advanced Drafting and Design (g)**

COURSE CODES:

▲ **ROP 67080** ▲ **WUHSD 3032A3** ▲ **ERUSD 00000** ▲ **STATE (CALPADS) 7711**

Industry Sector: Engineering and Architecture **Course Leads to:** Post-Secondary Education
Career Pathway: Architectural Design - 150
Classroom Hours: 180 **Course Level:** Capstone
Work Based Learning: 180 (optional)

Approved Textbook/Curriculum: *“Architecture-Residential Drafting and Design” Goodheart-Wilcox Company Inc.,*

POST-SECONDARY EDUCATION	INDUSTRY CERTIFICATIONS	EMPLOYMENT
Articulation with College No Dual Enrollment with College No UC Approved a-g elective credit No COLLEGE MAJOR Drafting and Design Technology Mechanical Engineering Engineering Technology Civil Engineering Architecture	None NEXT STEP Post-Secondary Education Internship	Related Careers (O*NET) 17-3011.01 Architectural Drafters 17-3012.01 Electronic Drafters 17-3013.00 Mechanical Drafters 17-3011.00 Architectural and Civil Drafters

Prerequisites:
 Drafting and Design

Course Description:
 This course is the capstone course in a 3-level program of architectural design and drawing. Students use their prior knowledge and research skills to first design, draw, and build a model inspired by ancient Roman architecture. Next, they will produce a residential project of their own creation. Implementing the design process, students start with programming for a "client" and then using sketching skills and ultimately 3-D computer program based drawing skills to develop and present their final designs for critique.

Integrated throughout the course are standards for Career Ready Practice and Academic Content Standards which include: appropriate technical skills and academic knowledge; communication skills; career planning; applied technology; critical thinking and problem solving; personal health and financial literacy; citizenship, integrity, ethical leadership and effective management; work productively while integrating cultural and global competence; creativity and innovation; reliable research strategies, and environment, social and economic impacts of decisions.

Course Outline

I. ORIENTATION

- A. Introduce course and facilities
- B. Discuss syllabus and major objectives
- C. Explain attendance, grading, classroom procedures, code of conduct
- D. Complete course safety requirements/test
- E. Evening of Excellence Essay

II. CAREERS IN DRAFTING AND DESIGN

- A. Research and report on the specialized occupations within the Engineering and Architecture industry sector
- B. Identify the steps in the hiring process from application to employment
- C. List the eligibility requirements for engineering and architecture industry positions
- D. Explain the impact of pre-service activities on employability (e.g., financial irresponsibility, criminal record, improper social media behavior, etc.)
- E. Describe the physical fitness requirements.
- F. Discuss environmentally-sound practices and sustainability within the industry sector

III. PREPARING FOR COLLEGE AND CAREERS

- A. Review and Discuss California CTE Model Curriculum Standards for Career Ready Practice
- B. Create an Education Plan and a Career Plan aligned with personal goals
- C. Create a Resumé
- D. Create a Career Portfolio
- E. Complete a handwritten/hand-printed Job Application neatly, legibly and with no corrections or mistakes
- F. Practice a professional job interview
- G. Evening of Excellence Essay

IV. ARCHITECTURAL STYLES

- A. Understand the different styles of architecture as it relates to residential design throughout history.
- B. Understand Roman and Greek through European, Early American, Traditional, and Modern and Contemporary structures.

V. ANCIENT ROMAN DESIGN

- A. Research ancient Roman structures, their cultural importance, and historic implications as it relates to modern architecture.
- B. Understand that there have been structures built by humans as long as humans have been on the planet and how these tie in to the culture and meaning of what it is to be human.
- C. Define a society, by looking to the past and develop a context for modern architecture.

VI. STRUCTURAL ELEMENTS

- A. Understand the structural elements used in construction techniques from early structures to modern.
- B. Research ancient Greek and Roman structures as well as the properties of the materials used.
- C. Understand how and why structures stand or fall.
- D. Understand how construction has evolved through to modern day techniques and technological advancements.

VII. RESIDENTIAL DESIGN PROCESS

- A. Understand how the design process is employed to show students how an idea becomes reality.
- B. Explore early to modern designs and the influences on those designs by the greater societal events of each era.
- C. Understand traffic flow, space planning, sustainable and universal (ADA) design concepts are introduced.

VIII. HOUSE DESIGN

- A. Design and develop a residential design using the design process and prior knowledge from Level 1 and 2.
- B. Explain three elements from ancient Roman designs but interpreted in a modern way.
- C. Define aesthetic elements in regards to the proportion, balance, composition, form, and materials.

Course Outline

IX. MODELS

- A. Understand spatial skills, planning, blue-print reading and vocabulary.
- B. Demonstrate hands-on techniques to explore the different structural elements and spatial relationships involved in designing space.
- C. Understand the material properties of paper, foam core, and matte board, as they take 2D drawings and build into 3D creations.

X. PORTFOLIO REVIEW

- A. Develop a binder or digital portfolio representative of completed work for presentation
- B. Prepare an effective multi-media oral presentation of the portfolio content

ESSENTIAL STANDARDS AND KEY ASSIGNMENTS

INDUSTRY SECTOR: Engineering & Architecture

ESSENTIAL PATHWAY STANDARD - A1.0

Understand how history shaped architecture and know significant events in the history of architectural design.

KEY ASSIGNMENT

ESSENTIAL PATHWAY STANDARD - A2.0

Compare the theoretical, practical, and contextual issues that influence design.

KEY ASSIGNMENT

ESSENTIAL PATHWAY STANDARD – A3.0

Understand the sketching processes used in concept development.

KEY ASSIGNMENT

ESSENTIAL PATHWAY STANDARD – A4.0

Understand the use of computer-aided drafting (CAD) in developing architectural designs.

KEY ASSIGNMENT

ESSENTIAL PATHWAY STANDARDS – A5.0

Understand methods used to analyze simple structures.

KEY ASSIGNMENT

CTE MODEL CURRICULUM STANDARDS FOR CAREER READY PRACTICE

- 1. Apply appropriate technical skills and academic knowledge.** Career-ready individuals readily access and use the knowledge and skills acquired through experience and education. They make connections between abstract concepts with real-world applications and recognize the value of academic preparation for solving problems, communicating with others, calculating measures, and performing other work-related practices.
- 2. Communicate clearly, effectively, and with reason.** Career-ready individuals communicate thoughts, ideas, and action plans with clarity, using written, verbal, electronic, and/or visual methods. They are skilled at interacting with others: they are active listeners who speak clearly and with purpose, and they are comfortable with terminology that is common to workplace environments. Career-ready individuals consider the audience for their communication and prepare accordingly to ensure the desired outcome.
- 3. Develop an education and career plan aligned with personal goals.** Career-ready individuals take personal ownership of their educational and career goals and manage their individual plan to attain these goals. They recognize the value of each step in the educational and experiential process, and they understand that nearly all career paths require ongoing education and experience to adapt to practices, procedures, and expectations of an ever-changing work environment. They seek counselors, mentors, and other experts to assist in the planning and execution of education and career plans.
- 4. Apply technology to enhance productivity.** 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 and using new technology. They understand the inherent risks—personal and organizational—of technology applications, and they take actions to prevent or mitigate these risks.
- 5. Utilize critical thinking to make sense of problems and persevere in solving them.** Career-ready individuals recognize problems in the workplace, understand the nature of the problems, and devise effective plans to solve the problems. They thoughtfully investigate the root cause of a problem prior to introducing solutions. They carefully consider options to solve a problem and, once agreed upon, follow through to ensure the problem is resolved.
- 6. Practice personal health and understand financial literacy.** Career-ready individuals understand the relationship between personal health and workplace performance. They contribute to their personal well-being through a healthy diet, regular exercise, and mental health activities. Career-ready individuals also understand that financial literacy leads to a secure future that enables career success.
- 7. Act as a responsible citizen in the workplace and the community.** Career-ready individuals understand the obligations and responsibilities of being a member of a community and demonstrate this understanding every day through their interactions with others. They are aware of the impacts of their decisions on others and the environment around them, and they think about the short-term and long-term consequences of their actions. They are reliable and consistent in going beyond minimum expectations and in participating in activities that serve the greater good.
- 8. Model integrity, ethical leadership, and effective management.** Career-ready individuals consistently act in ways that align with personal and community-held ideals and principles. They employ ethical behaviors and actions that positively influence others. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the direction and actions of a team or organization, and they recognize the short-term and long-term effects that management's actions and attitudes can have on productivity, morale, and organizational culture.
- 9. Work productively in teams while integrating cultural and global competence.** Career-ready individuals contribute positively to every team, as both team leaders and team members. To avoid barriers to productive and positive interaction, they apply an awareness of cultural differences. They interact effectively and sensitively with all members of the team and find ways to increase the engagement and contribution of other members.
- 10. Demonstrate creativity and innovation.** Career-ready individuals recommend ideas that solve problems in new and different ways and contribute to the improvement of the organization. They consider unconventional ideas and suggestions by others as solutions to issues, tasks, or problems. They discern which ideas and suggestions may have the greatest value. They seek new methods, practices, and ideas from a variety of sources and apply those ideas to their own workplace practices.
- 11. Employ valid and reliable research strategies.** Career-ready individuals employ research practices to plan and carry out investigations, create solutions, and keep abreast of the most current findings related to workplace environments and practices. They use a reliable research process to search for new information and confirm the validity of sources when considering the use and adoption of external information or practices.
- 12. Understand the environmental, social, and economic impacts of decisions.** Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact other people, organizations, the workplace, and the environment. They are aware of and utilize new technologies, understandings, procedures, and materials and adhere to regulations affecting the nature of their work. They are cognizant of impacts on the social condition, environment, workplace, and profitability of the organization.

1: Academics

Analyze and apply appropriate academic standards required for successful industry sector pathway completion leading to postsecondary education and employment. Refer to the industry sector alignment matrix for identification of standards. Note: alignment listed within each sector Anchor Standard

2: Communications Language Standard

Acquire and accurately use general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the (career and college) readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. LS 9-10, 11-12.6 Anchor Standard

3: Career Planning and Management Speaking and Listening Standard

Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. SLS 11-12.2 Anchor Standard

4: Technology Writing Standard

Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments and information. WS 11-12.6 Anchor Standard

5: Problem Solving and Critical Thinking Writing Standard

Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem, narrow or broaden the inquiry when appropriate, and synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. WS 11-12.7 Anchor Standard

6: Health and Safety Reading Standards for Science and Technical Subjects

Determine the meaning of symbols, key words, and other domain-specific words and phrases as they are used in a specific scientific or technical context. RSTS 9-10 11-12.4 Anchor Standard

7: Responsibility and Flexibility Speaking and Listening Standard

Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners, building on others' ideas and expressing their own clearly and persuasively. SLS 9-10 11-12.1 Anchor Standard

8: Ethics and Legal Responsibilities Speaking and Listening Standard

Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the work. SLS 11-12.1d Anchor Standard

9: Leadership and Teamwork Speaking and Listening Standard

Work with peers to promote civil, democratic discussions and decision making; set clear goals and deadlines; and establish individual roles as needed. SLS 11-12.1b Anchor Standard

10: Technical Knowledge and Skills Writing Standard

Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. WS 11-12.6 Anchor Standard

11: Demonstration and Application

Demonstrate and apply the knowledge and skills contained in the industry-sector anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and the career technical student organization.